

25

DHS COMPARATIVE STUDIES

Maternal Health Care



**DEMOGRAPHIC
AND HEALTH
SURVEYS**

The Demographic and Health Surveys (DHS) is a 13-year project to assist government and private agencies in developing countries to conduct national sample surveys on population and maternal and child health. Funded primarily by the U.S. Agency for International Development (USAID), DHS is administered by Macro International Inc. in Calverton, Maryland.

The main objectives of the DHS program are (1) to promote widespread dissemination and utilization of DHS data among policymakers, (2) to expand the international population and health database, (3) to advance survey methodology, and (4) to develop in participating countries the skills and resources necessary to conduct high-quality demographic and health surveys.

For information about the Demographic and Health Surveys program, write to DHS, Macro International Inc., 11785 Beltsville Drive, Suite 300, Calverton, MD 20705, U.S.A. (Telephone 301-572-0200; Fax 301-572-0999).

**Demographic and Health Surveys
Comparative Studies No. 25**

Maternal Health Care

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Preface

One of the most significant contributions of the DHS program is the creation of an internationally comparable body of data on the demographic and health characteristics of populations in developing countries. The *DHS Comparative Studies* series and the *DHS Analytical Reports* series examine these data across countries in a comparative framework, focusing on specific topics.

The objectives of DHS comparative research are: to describe similarities and differences between countries and regions, to highlight subgroups with specific needs, to provide information for policy formulation at the international level, and to examine individual country results in an international context. While *Comparative Studies* are primarily descriptive, *Analytical Reports* utilizes a more analytical approach.

The comparative analysis of DHS data is carried out primarily by staff at the DHS headquarters in Calverton, Maryland. The topics covered are selected by staff in conjunction with the DHS Scientific Advisory Committee and USAID.

The *Comparative Studies* are based on a variable number of data sets reflecting the number of countries for which data were available at the time the report was prepared. Each report provides detailed tables and graphs for countries in four regions: sub-Saharan Africa, the Near East and North Africa, Asia, and Latin America and the Caribbean. Survey-related issues such as questionnaire comparability, survey procedures, data quality, and methodological approaches are addressed in each report, as necessary. Where appropriate, data from previous DHS surveys are used to evaluate trends over time.

Comparative Studies published under the current phase of the DHS program (DHS-III) are, in some cases, updates and expansions of reports published earlier in the series. Other reports, however, will cover new topics that reflect the expanded substantive scope of the DHS program.

It is anticipated that the availability of comparable information for a large number of developing countries will have long-term usefulness for analysts and policymakers in the fields of international population and health.

Martin Vaessen
Project Director

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Executive Summary

A number of factors have contributed to an increased attention to the problem of maternal mortality over the past decade. International conferences, such as the 1987 Safe Motherhood Conference in Nairobi and the 1994 International Conference on Population and Development in Cairo, have played important roles. These forums have worked in concert with research documenting the preventable nature of most maternal deaths, and with public health experts advocating equal emphasis on the "M" in MCH (Rosenfield and Maine, 1985). Together, these and other efforts have succeeded in bringing maternal health and survival closer to the top of the agendas of national governments and international funding agencies.

As activities in this arena have moved from advocacy to intervention, a great deal of effort and thought has been invested in determining ideal methods for evaluating program interventions. Much of the debate on this topic has centered around the question of appropriate indicators of program process and impact. While no consensus has been reached on this question, an inevitable outcome of these discussions has been an increased demand for data.

The Demographic and Health Surveys Program (DHS), now in its third five-year phase, has been collecting data on maternal health service utilization since its beginning in 1984. While some of the original questions remain in the standard questionnaire, others have been revised, added, or deleted over time. The purpose of this report is to present and discuss the data related to maternal health which have been collected in the second and third phases of the DHS.

While coverage of antenatal care is above 90 percent in 9 of the 35 countries, 4 countries have levels below 35 percent. In a third of the countries surveyed, more than 25 percent of the births to women receiving antenatal care had missed opportunities for tetanus immunization during those visits. At the same time, in almost all countries, women receiving any tetanus immunizations are more likely to have had two doses than just one.

In general, women are less likely to be delivered by a trained attendant than to receive antenatal care or tetanus immunization. In addition, differentials in access to delivery care are much greater than for antenatal care and tetanus toxoid indicators. Births to urban women are two and a half to three times more likely to have delivery care than births to rural women in 15 countries. This is unfortunate, given the causative role of birth-related complications in maternal mortality. The problem of poor access to delivery care is further reflected by the finding that fewer than one-third of the countries have the recommended level of caesarean-section deliveries between 5 and 15 percent.

Analysis of the change in indicators between subsequent surveys in the same country revealed approximated increases of more than 25 percent in seven countries for tetanus toxoid, in four countries for antenatal care, and in one country for delivery care. Examination of differentials for all three indicators shows that where coverage increased, access seems to have improved among women who are typically underserved.

Data on perceived problems at childbirth indicate that women who think they have a problem are slightly more likely to deliver with a trained attendant. Examination of national levels of perinatal mortality and service coverage suggest that mortality levels are lower in countries with higher levels of service use.

While the data presented here are in no way comprehensive, they indicate where countries fall in relation to each other and point to populations within countries where problems of access and service availability are particularly relevant. It is hoped that these data will be supplemented in the future as further efforts are made to develop, test, and fine-tune new indicators and data collection instruments.

1 Introduction

A number of factors have contributed to an increased attention to the problem of maternal mortality over the past decade. International conferences, such as the 1987 Safe Motherhood Conference in Nairobi and the 1994 International Conference on Population and Development in Cairo, have played important roles. These forums have worked in concert with research documenting the preventable nature of most maternal deaths, and with public health experts advocating equal emphasis on the "M" in MCH (Rosenfield and Maine, 1985). Together, these and other efforts have succeeded in bringing maternal health and survival closer to the top of the agendas of national governments and international funding agencies.

As activities in this arena have moved from advocacy to intervention, a great deal of effort and thought has been invested in determining ideal methods for evaluating program interventions. Much of the debate on this topic has centered around the question of appropriate indicators of program process and impact. While no consensus has been reached on this question, an inevitable outcome of these discussions has been an increased demand for data.

The Demographic and Health Surveys Program (DHS), now in its third five-year phase, has been collecting data on maternal health service utilization since its beginning in 1984. While some of the original questions remain in the standard questionnaire, others have been revised, added, or deleted over time. Because of the number of countries surveyed through the DHS program, and because of the mandate to collect data that is as comparable as possible across countries, it has not been feasible to make major changes in questions during a given phase of the DHS program. While there is ongoing debate about which indicators are most appropriate, DHS continues to collect data for standard, though admittedly imperfect, indicators, while at the same time, testing new instruments and exploring different methods of data collection.

1.1 PURPOSE AND ORGANIZATION OF REPORT

The purpose of this report is to present and discuss the data related to maternal health that have been collected in the second and third phases of the DHS program. Much of the data presented are an update of an earlier DHS publication on high-risk births and maternity care (Govindasamy et al., 1993). However, this report also includes data from responses to new questions that were added to the questionnaires used in the second (DHS-II) and third (DHS III) phases of DHS.

Section 1 of this report describes the data sources and defines the indicators to be presented in later sections of the report. Section 2 presents data on maternal health care coverage

and examines differentials. Section 3 looks at differences in indicators as measured in surveys conducted sequentially in the same country, for countries with more than one DHS. Section 4 examines data on perceived problems around childbirth. Section 5 presents data on perinatal mortality and maternal health care, and the last section summarizes the findings of the whole report.

1.2 SOURCES OF DATA

The countries included in this report are those for which a standard recode data file was available at the time of analysis, as well as India.¹ Table 1.1 lists the 35 surveys of this category and are covered in this report. For ease of reference, countries are grouped into three regions in the tables: 17 countries in sub-Saharan Africa; 10 countries in Asia, the Near East, and North Africa; and 8 countries in Latin America and the Caribbean.

In DHS-II and III, data were collected from women who reported having live births during the three years² preceding the survey on the characteristics of their births as well as on their utilization of maternity care services. Specifically, for each live birth a woman had during that time period, she was asked:

- Who, if anyone, she saw for antenatal care
- How many months pregnant she was when she first saw someone for care
- How many such visits she had
- If, during that pregnancy, she had received an injection to prevent tetanus
- How many times she received the injection
- Where she gave birth
- Who assisted with the delivery
- Whether she experienced specific symptoms of a complication at delivery
- Whether the child was born prematurely or on time
- Whether the child was delivered by caesarean section
- The size of the child at birth
- The weight of the child at birth.

Though a standard format was followed for data collection in most surveys, there were several exceptions. Table 1.2 summarizes the information available for each of the 35 countries covered in this report and indicates where questions or coding of responses departed from the standard format.

¹ The survey in India was not conducted under the DHS program but used the DHS core questionnaire and procedures.

² In the core questionnaire in DHS-II women were asked about live births in the past five years and in some countries for DHS-II women were asked about births occurring during the four or five years preceding the survey.

Table 1.1 Summary of DHS surveys, 1990-1996

Date of fieldwork, eligible respondents, and number of women interviewed, Demographic and Health Surveys, 1990-1996

Country	Year of fieldwork	Eligible respondents	Number of women interviewed
SUB-SAHARAN AFRICA			
Burkina Faso	1992/93	All women 15-49	6,354
Cameroon	1991	All women 15-49	3,871
Central Africa Republic	1994/95	All women 15-49	5,884
Cote d'Ivoire	1994	All women 15-49	8,099
Ghana	1993	All women 15-49	4,562
Kenya	1993	All women 15-49	7,540
Madagascar	1992	All women 15-49	6,260
Malawi	1992	All women 15-49	4,850
Namibia	1992	All women 15-49	5,421
Niger	1992	All women 15-49	6,503
Nigeria	1990	All women 15-49	8,781
Rwanda	1992	All women 15-49	6,551
Senegal	1992/93	All women 15-49	6,310
Tanzania	1991/92	All women 15-49	9,238
Uganda	1995	All women 15-49	7,070
Zambia	1992	All women 15-49	7,060
Zimbabwe	1994	All women 15-49	6,128
ASIA/NEAR EAST/ NORTH AFRICA			
Bangladesh	1993/94	Ever married women 10-49	9,640
Egypt	1995/96	Ever married women 15-49	4,779
India	1992/93	Ever married women 13-49	89,777
Indonesia	1994	Ever married women 15-49	28,168
Jordan	1990	Ever married women 15-49	6,000
Kazakstan	1995	All women 15-49	3,771
Morocco	1992	All women 15-49	9,256
Pakistan	1990-91	Ever married women 15-49	6,661
Philippines	1993	All women 15-49	15,029
Turkey	1993	Ever married women <50	6,519
LATIN AMERICA/ CARIBBEAN			
Bolivia	1993/94	All women 15-49	8,603
Brazil	1996	All women 15-49	16,800
Colombia	1995	All women 15-49	11,140
Dominican Republic	1991	All women 15-49	7,320
Guatemala	1995	All women 15-49	10,000
Haiti	1994/95	All women 15-49	5,709
Paraguay	1990	All women 15-49	5,827
Peru	1991/92	All women 15-49	15,882

1.3 INDICATOR DEFINITIONS

Three of the main indicators presented throughout this report are: antenatal care by a trained person; tetanus toxoid immunization during pregnancy; and delivery with a trained attendant. For purposes of this report, antenatal care only includes doctors, nurses, and trained nurse midwives, and other

formally trained personnel, such as paramedics, when applicable. The same definition is used for persons attending delivery. Traditional birth attendants, even if reported as "trained," are not included in the indicator. For tetanus toxoid, unless otherwise indicated, those with tetanus toxoid include all those who reported receiving at least one tetanus toxoid injection during pregnancy.

Table 1.2. Summary of information on maternity care and characteristics of births

Information on year of fieldwork, period of births covered by the survey, and on whether the survey included questions on antenatal care (ANC), tetanus toxoid (TT), delivery care (DC), prematurity, delivery by caesarean section, size and weight of child at birth, and symptoms of complications at birth, by country, Demographic and Health Surveys, 1990-1996

Country	Year of fieldwork	Period of births covered (years)	Who provided ANC	Gestation at first ANC visit	Number of ANC visits	TT in pregnancy	Number of TT doses	Place of birth	Who attended delivery	Premature birth	Delivery by C-section	Size of child at birth	Birth weight	Symptoms of birth complications
SUB-SAHARAN AFRICA														
Cameroon	1991	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ¹	yes	no
Central African Republic	1994/95	3	yes	yes	yes	yes	yes	yes	yes	no	yes	yes ¹	yes	no ⁴
Cote d'Ivoire	1994	3	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
Ghana	1993	3	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	no
Kenya	1993	5	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	no
Madagascar	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Malawi	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no ⁴
Namibia	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ⁴
Niger	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Nigeria	1990	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Rwanda	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Senegal	1992/93	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ³	yes	no
Tanzania	1991/92	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ²	yes	no
Uganda	1995	4	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	no ⁴
Zambia	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ⁴
Zimbabwe	1994	3	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
ASIA/NEAR EAST/ NORTH AFRICA														
Bangladesh	1993/94	3	yes	yes	yes	yes	yes	yes	yes	no	no	no	no	no ⁴
Egypt	1995/96	5	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
India	1992/93	4	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ⁴
Indonesia	1994	5	yes	yes	yes	yes	yes	yes	yes	yes ³	yes	yes	yes	yes ⁴
Jordan	1990	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no ⁴
Kazakhstan	1995	3	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
Morocco	1992	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ⁴
Pakistan	1990/91	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ⁴
Philippines	1993	5	yes	yes	yes	yes	yes	yes	yes	yes ³	yes	yes	yes	no
Turkey	1993	5	yes	yes	yes	yes	yes	yes	yes	yes ³	yes	no	no	no
LATIN AMERICA/ CARIBBEAN														
Bolivia	1993/94	3	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
Brazil	1996	5	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
Colombia	1995	5	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes ⁴
Dominican Republic	1991	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ⁴
Guatemala	1995	5	yes	yes	yes	yes	yes	yes	yes	no	yes	yes ¹	yes	yes ⁴
Haiti	1994/95	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Paraguay	1990	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes ²	yes	no
Peru	1991/92	5	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no

¹ Response categories did not include "very large"

² Response categories did not include "very small" or "very large"

³ Question asked about pregnancy duration

⁴ Specific wording of questions varied from country to country

2 Service Coverage

2.1 ANTENATAL CARE

Antenatal care provides an opportunity for a variety of preventive interventions for pregnant women, including tetanus toxoid immunizations, nutrition education, and counseling about their plans for delivery and postpartum family planning. It also allows women who meet known risk criteria to be identified and monitored, and subsequently, referred for delivery care. Ideally, pre-existing and new medical problems such as malaria, anemia, and syphilis can also be detected and managed during antenatal care visits. It is also during such visits that providers can develop rapport with women, making them more likely to seek assistance during labor and delivery should an emergency occur.

Table 2.1 shows the percentage of live births for which women received antenatal care from a trained provider (doctor, nurse, or midwife), according to residence, education, maternal age, birth order, and interval. The proportion of births for which women received antenatal care ranged from more than 90 percent in Kenya, Malawi, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Kazakhstan, and the Dominican Republic to less than 35 percent in Niger, Bangladesh, Morocco, and Pakistan. On a regional basis, sub-Saharan Africa, as a whole, is not worse than other regions in overall coverage of antenatal care. In all countries except Kazakhstan, births to women in rural areas were less likely to receive antenatal care than those born to women in urban areas. With the exception of Zimbabwe, births to women with no education were least likely to receive antenatal care, while those with secondary or higher levels of education were most likely to receive such care. In six out of seven countries, births to women more than 35 years of age and fifth or higher order births were least likely to receive care, though in many countries the differences were small. In some countries, the educational differentials were very large; in Niger, Bangladesh, Egypt, Morocco, Pakistan, and Bolivia, the percentage of births to women with secondary or higher education who received antenatal care was three or more times greater than among women with no education.

The number and timing of antenatal care visits can be a factor in its effectiveness. Table 2.2 shows the percent distribution of live births by the number of antenatal care visits women had during pregnancy, and the stage during pregnancy when the first visit occurred. In 33 of 35 countries, among the births for which any antenatal care was received, a larger proportion had 3 or more visits than had fewer than this number. The two exceptions were Rwanda and Bangladesh. The proportion of births where the woman had four or more visits ranged from less than 10 percent in Niger, Bangladesh, and Morocco to more than 80 percent in Kazakhstan and the Dominican Republic. At the same time, the median number of visits ranged from less than one in Bangladesh, Egypt, Morocco, Niger, and Pakistan

to more than seven in the Dominican Republic. Among the births where women received antenatal care, very few waited to have their first visit in the third trimester, except in Rwanda. The median duration of pregnancy at the time of the first visit ranged from less than four months in Senegal, Egypt, Indonesia, Jordan, Kazakhstan, Morocco, Turkey, and in all the Latin American countries surveyed, to nearly 7 (6.9) months in Rwanda. While women in sub-Saharan Africa tended to have their first antenatal care visit a bit later than those in other regions, the median number of visits was slightly lower overall for the Asia/Near East/North Africa region.

Table 2.3 shows the percentage of live births where the woman had three or more antenatal visits with the first occurring before the third trimester, by the woman's background characteristics. The percent of births falling into this preferred category range from less than 20 in Niger, Bangladesh, Morocco, and Pakistan to more than 75 in Tanzania, Zimbabwe, Kazakhstan, Brazil, Colombia, the Dominican Republic, and Paraguay. With the exception of Zimbabwe and Kazakhstan, births to women in rural areas were less likely to receive frequent care that began early. In all countries, births to women with no education were less likely to receive frequent and early care. In three out of four countries surveyed, births to women in the youngest and oldest age groups were also less likely to receive such care. Births in the higher risk fifth or greater order, short interval category were least likely to receive early, frequent care in 9 out of 10 countries.

2.2 TETANUS TOXOID IMMUNIZATION

The World Health Organization recommends that all women receive two tetanus toxoid injections during their first pregnancy, a third dose 6 to 12 months later or during their next pregnancy, a fourth dose at least a year later or during the subsequent pregnancy, and a fifth dose at least one year later or during the subsequent pregnancy. The fifth dose is thought to provide lifelong protection (World Health Organization, 1987). In the DHS, women are only asked about tetanus toxoid immunizations received during pregnancy for births occurring in the past three to five years. Therefore, the proportion of the unimmunized who may not have needed an injection due to complete coverage prior to the index pregnancy cannot be determined. However, this is unlikely to be a problem except perhaps among higher parity women and in countries where many women obtain immunizations outside of pregnancy.

Table 2.1 Differentials in antenatal care coverage

Percentage of recent live births for which women received antenatal care (ANC) from a medically trained person, by residence, level of education, maternal age, and birth order/birth interval, Demographic and Health Surveys, 1990-1996

Country	Percent births for which ANC was received	Residence		Highest educational level		Maternal age at birth			Birth order/interval				Number of births		
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+		5+, <24	5+, 24+
SUB-SAHARAN AFRICA															
Burkina Faso	58.5	94.9	52.5	55.1	82.5	94.8	57.4	59.3	56.5	60.7	51.3	61.3	49.4	57.4	6,366
Cameroon	78.6	91.7	70.3	56.5	93.7	98.1	78.3	79.5	74.3	85.8	78.9	82.4	64.5	73.6	3,488
Central African Republic	66.9	89.6	51.1	52.6	76.3	93.7	69.9	67.5	57.4	70.7	67.4	65.9	67.8	64.8	2,837
Cote d'Ivoire	83.2	96.3	76.5	78.3	91.1	97.8	82.7	84.0	80.0	87.1	81.8	83.8	74.7	81.7	3,989
Ghana	85.6	96.3	81.4	75.0	91.9	99.2	87.4	86.3	80.5	89.5	79.0	87.3	76.7	82.2	2,204
Kenya	94.8	97.3	94.4	87.8	95.8	98.2	93.4	95.3	93.8	94.7	95.8	95.6	91.4	94.5	6,128
Madagascar	77.9	86.7	76.6	59.7	80.0	90.4	75.3	78.3	79.8	80.1	76.6	78.5	76.2	77.1	5,683
Malawi	90.1	U	U	85.8	94.5	97.0	92.0	91.1	84.9	92.2	92.4	92.1	83.9	87.7	4,574
Namibia	87.1	89.8	85.8	69.3	89.6	93.0	85.6	88.4	83.6	88.7	85.4	88.4	86.7	84.1	3,859
Niger	29.9	85.7	19.8	26.5	60.0	91.7	30.2	30.2	28.2	32.1	29.9	32.3	25.1	28.5	7,207
Nigeria	58.8	84.4	52.0	45.8	75.3	92.5	50.7	61.7	53.9	61.7	63.0	58.8	51.1	58.0	8,205
Rwanda	94.4	97.1	94.3	92.0	96.3	98.9	93.6	94.9	92.9	95.7	94.3	95.4	92.1	93.4	5,662
Senegal	73.6	94.1	63.2	68.8	93.7	98.0	70.6	75.0	70.6	78.5	74.5	75.9	70.1	69.6	5,645
Tanzania	91.8	97.8	90.2	86.3	94.5	99.1	91.7	92.4	89.1	93.2	92.9	92.4	88.0	90.3	8,117
Uganda	91.2	95.0	90.7	85.8	92.7	98.6	92.5	91.3	87.9	92.9	94.1	91.4	87.6	89.4	6,027
Zambia	92.2	98.1	87.1	80.5	93.5	98.4	91.9	92.9	89.4	92.3	92.7	92.9	92.2	91.2	6,279
Zimbabwe	93.1	95.4	92.3	91.8	90.9	96.4	95.5	93.2	89.0	95.6	90.7	94.2	89.0	89.6	2,364
ASIA/NEAR EAST/ NORTH AFRICA															
Bangladesh	25.9	53.9	22.8	16.7	27.0	58.0	28.5	25.6	18.3	34.9	25.0	24.8	18.1	18.3	3,926
Egypt	39.1	58.3	27.2	22.0	35.2	65.6	32.9	40.6	36.1	53.6	35.4	42.7	17.1	24.9	11,454
India	49.2	76.9	41.0	34.4	69.0	87.4	50.6	50.2	28.5	62.0	52.6	48.8	30.8	28.8	50,001
Indonesia	82.3	95.4	77.3	56.7	81.1	95.9	81.4	83.5	75.9	88.4	77.0	85.2	62.2	71.8	16,983
Jordan	80.2	85.1	69.2	65.2	75.6	87.0	84.5	81.2	73.6	91.1	80.9	83.7	72.1	77.2	8,261
Kazakhstan	92.5	91.7	93.1	-	-	92.8	95.0	91.8	94.9	95.8	87.7	91.2	86.8	93.0	810
Morocco	32.2	60.5	17.5	23.2	60.1	87.4	28.9	33.8	28.0	45.2	30.3	38.3	15.8	23.7	5,197
Pakistan	25.5	56.5	11.7	16.6	37.5	72.9	23.1	27.4	16.5	30.5	30.5	27.9	22.2	17.7	6,492
Philippines	83.1	88.3	78.1	33.4	74.0	92.2	80.4	84.3	78.7	89.2	83.6	86.1	73.4	75.5	8,859
Turkey	62.5	73.3	46.4	35.1	69.7	91.6	62.9	64.3	42.7	76.8	57.1	66.8	21.1	37.9	3,736
LATIN AMERICA/ CARIBBEAN															
Bolivia	52.5	67.7	35.7	21.8	42.4	77.4	50.9	55.1	42.4	62.2	56.3	57.5	40.3	38.4	3,615
Brazil	85.6	91.4	67.8	54.6	79.4	94.3	83.2	87.0	80.4	92.6	76.5	90.1	51.3	71.5	4,782
Colombia	82.5	89.7	69.8	47.0	74.0	93.6	79.2	84.1	77.4	90.5	75.8	86.0	48.2	64.5	5,050
Dominican Republic	96.8	97.6	95.6	85.3	97.1	99.0	95.8	97.2	95.7	98.6	94.7	97.6	96.1	93.1	3,848
Guatemala	52.5	70.8	43.7	35.2	56.2	91.6	48.8	54.6	47.1	61.8	53.2	57.2	38.3	43.7	9,150
Haiti	67.7	82.5	60.6	52.8	78.2	94.3	70.5	70.3	55.8	80.7	69.2	70.0	50.3	57.3	3,624
Paraguay	83.9	92.8	76.4	47.3	80.8	98.1	82.5	85.6	78.0	91.1	84.3	88.0	72.1	75.4	3,975
Peru	66.1	81.9	41.8	35.5	50.6	86.3	62.5	68.0	60.1	78.9	63.6	70.4	44.2	51.2	8,540

U = Unknown (not available)

Table 2.2 Number of antenatal care visits and stage of pregnancy

Percent distribution of recent births by number of antenatal care visits (ANC), and by the stage of pregnancy at the time of the first ANC visit, Demographic and Health Surveys, 1990-1996

Country	Number of ANC visits					Time of first visit			Median months pregnant at first visit	Number of births			
	Median ANC visits					DK/missing	7+	DK/missing					
	0	1	2	3	4+								
SUB-SAHARAN AFRICA													
Burkina Faso	40.0	4.9	10.8	18.7	22.5	3.1	2.3	40.0	48.6	8.1	3.4	4.8	6,366
Cameroun	21.0	2.6	7.7	16.1	49.0	3.5	4.0	21.0	73.6	5.0	0.4	4.3	3,488
Central African Republic	22.1	5.6	11.0	19.0	39.7	2.6	3.5	22.1	70.3	6.7	0.9	4.8	2,837
Cote d'Ivoire	15.5	13.7	21.2	20.2	28.7	0.7	3.0	15.5	67.7	16.0	0.7	5.4	3,989
Ghana	12.7	4.8	7.6	14.4	58.8	1.7	4.7	12.7	78.2	7.5	1.6	4.5	2,204
Kenya	3.8	2.6	7.4	19.2	63.7	3.4	4.7	3.8	78.9	15.7	1.6	5.6	6,128
Madagascar	13.6	4.5	13.0	23.6	42.6	2.8	3.7	13.6	72.3	12.3	1.8	5.4	5,683
Malawi	7.2	2.0	7.1	18.8	62.6	2.3	4.6	7.2	74.0	17.8	1.0	5.9	4,574
Namibia	11.8	6.3	6.2	12.1	55.8	7.8	4.6	11.8	76.8	9.3	2.1	4.8	3,859
Niger	69.5	2.8	7.3	11.5	8.3	0.5	0.7	69.5	26.5	3.3	0.7	4.6	7,207
Nigeria	34.7	2.3	3.5	6.1	51.5	1.9	4.3	34.7	52.6	10.2	2.6	5.3	8,205
Rwanda	5.1	11.2	37.8	33.6	12.0	0.1	2.9	5.1	51.1	43.5	0.3	6.9	5,662
Senegal	21.1	7.0	14.0	40.7	13.3	3.8	3.1	21.1	68.8	6.1	4.0	3.9	5,645
Tanzania	3.7	1.0	5.5	18.0	69.3	2.4	4.9	3.7	83.2	12.6	0.5	5.6	8,117
Uganda	7.5	6.3	13.7	23.5	47.2	1.8	3.9	7.5	71.3	20.8	0.4	5.9	6,027
Zambia	6.4	2.0	6.2	14.4	68.4	2.7	5.1	6.4	80.8	12.3	0.5	5.6	6,279
Zimbabwe	5.6	1.4	4.0	12.4	74.1	2.5	5.6	5.6	81.0	12.0	1.4	5.1	2,364
ASIA/NEAR EAST/ NORTH AFRICA													
Bangladesh	72.4	7.8	8.4	5.6	5.4	0.3	0.7	72.4	21.9	5.5	0.2	5.0	3,926
Egypt	60.7	2.1	4.6	4.0	28.3	0.4	0.8	60.7	37.1	2.0	0.3	2.8	11,454
India	50.1	5.4	11.2	13.5	19.9	0.0	1.0	50.1	39.7	10.2	0.0	5.0	50,001
Indonesia	12.7	4.3	6.8	12.4	63.1	0.8	5.4	12.7	80.7	6.1	0.5	3.5	16,983
Jordan	19.2	3.4	4.5	5.0	67.1	0.8	6.3	19.2	76.0	3.9	0.9	3.0	8,261
Kazakhstan	7.3	1.9	2.1	3.6	81.9	3.2	10.7	7.3	89.6	2.3	0.8	3.5	810
Morocco	67.6	9.4	5.8	9.3	7.8	0.1	0.7	67.6	28.5	3.8	0.1	3.6	5,197
Pakistan	69.7	4.8	4.6	3.8	14.1	2.9	0.7	69.7	21.7	6.0	2.5	4.0	6,492
Philippines	7.7	6.5	12.4	20.3	52.1	1.1	4.2	7.7	83.4	8.3	0.7	4.3	8,859
Turkey	36.9	8.1	9.7	8.6	36.1	0.6	2.5	36.9	58.6	3.9	0.7	3.1	3,736
LATIN AMERICA/ CARIBBEAN													
Bolivia	46.5	6.9	6.7	7.8	31.8	0.4	1.5	46.5	47.0	6.2	0.3	3.6	3,615
Brazil	13.2	1.2	2.2	4.7	75.9	2.8	6.9	13.2	83.9	1.5	1.5	2.9	4,782
Colombia	16.8	2.1	3.4	7.0	70.3	0.4	6.2	16.8	80.2	2.9	0.2	3.0	5,050
Dominican Republic	2.9	1.6	3.8	6.5	84.7	0.6	7.5	2.9	93.9	2.9	0.3	3.1	3,848
Guatemala	13.7	3.2	6.5	11.7	64.7	0.3	5.2	13.7	82.5	3.4	0.4	2.7	9,150
Haiti	29.0	7.5	11.6	15.2	35.6	1.0	3.1	29.0	65.1	5.2	0.7	3.8	3,624
Paraguay	8.7	4.5	7.8	13.0	64.9	1.2	5.8	8.7	84.3	6.6	0.5	3.5	3,975
Peru	31.8	4.6	7.2	8.7	46.7	1.0	3.7	31.8	61.3	6.2	0.8	3.4	8,540

Table 2.3 Antenatal visits by background characteristics

Percentage of recent live births for which women made three or more antenatal visits where the first occurred before the end of the sixth month of pregnancy, by residence, level of education, maternal age and birth order/birth interval, Demographic and Health Surveys, 1990-1996

Country	Percent births w/3+ANC visits & 1st before 7 mos.	Residence		Highest educational level			Maternal age at birth			Birth order/interval					Number of births
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+	5+, <24	5+, ≥24	
SUB-SAHARAN AFRICA															
Burkina Faso	37.2	72.6	31.3	33.6	61.6	77.0	34.9	38.9	32.3	38.9	35.7	40.6	29.0	34.4	6,366
Cameroon	63.2	76.1	54.8	38.0	78.4	88.8	60.8	64.4	60.8	69.2	64.4	67.2	50.5	57.8	3,488
Central African Republic	56.1	72.2	44.8	43.4	64.0	80.6	59.3	56.4	47.8	59.3	58.9	54.8	52.3	54.9	2,837
Cote d'Ivoire	45.9	59.9	38.7	37.8	57.2	74.6	47.7	46.5	39.2	55.0	47.6	48.1	32.8	38.8	3,989
Ghana	69.5	86.0	63.1	55.4	77.3	94.3	70.7	70.2	65.4	74.7	60.9	71.3	56.2	66.1	2,204
Kenya	74.3	78.0	73.8	68.0	74.2	80.0	73.5	75.8	67.1	75.5	75.3	75.9	70.2	72.4	6,128
Madagascar	60.4	69.8	59.0	46.1	60.3	75.0	53.0	62.6	59.6	60.8	58.3	62.0	59.5	59.8	5,683
Malawi	70.5	U	U	66.4	74.2	83.6	74.8	70.2	67.0	76.3	72.8	70.5	63.0	68.3	4,574
Namibia	62.5	67.0	60.3	45.2	62.2	72.7	52.6	65.0	62.4	61.5	57.0	64.1	65.3	62.7	3,859
Niger	18.9	63.1	10.9	16.0	42.5	76.6	15.8	20.1	17.3	18.3	19.1	20.7	16.0	18.5	7,207
Nigeria	49.3	73.4	42.9	37.1	64.1	82.3	44.9	51.5	43.6	52.8	54.6	49.6	44.0	46.4	8,205
Rwanda	34.9	58.6	33.7	32.6	34.7	58.5	28.1	36.2	32.7	41.0	33.8	34.6	31.5	32.9	5,662
Senegal	51.9	74.1	40.6	45.8	75.2	86.7	43.8	54.6	48.9	53.6	53.6	54.1	50.1	48.9	5,645
Tanzania	78.9	80.2	78.6	74.0	81.5	84.1	81.6	79.2	74.4	82.3	79.2	80.2	74.1	75.7	8,117
Uganda	59.8	70.5	58.4	53.8	60.6	72.9	60.2	60.3	56.3	63.9	59.7	60.0	51.4	59.2	6,027
Zambia	74.1	78.7	70.1	59.7	74.8	84.1	76.2	74.5	68.1	76.9	75.3	75.9	73.1	69.7	6,279
Zimbabwe	78.1	75.4	79.0	74.1	76.4	81.6	81.4	78.6	70.6	81.8	75.7	80.4	68.1	72.1	2,364
ASIA/NEAR EAST/ NORTH AFRICA															
Bangladesh	10.5	36.8	7.6	4.1	9.6	35.8	10.4	10.8	8.1	16.3	7.5	10.2	4.0	6.0	3,926
Egypt	31.4	52.9	18.1	14.2	27.6	58.0	23.3	33.0	29.6	45.0	26.9	35.5	11.7	17.2	11,454
India	29.4	53.8	22.2	16.0	41.9	69.3	29.1	30.6	13.4	41.7	30.8	28.5	13.1	12.4	50,001
Indonesia	73.2	89.0	67.2	44.4	70.6	91.0	72.5	74.6	65.0	81.0	67.3	76.2	51.5	60.1	16,983
Jordan	70.6	75.7	59.1	54.1	65.5	78.0	74.9	71.8	62.6	83.7	70.8	76.2	61.2	66.3	8,261
Kazakhstan	83.9	83.1	84.5	-	-	84.2	90.2	82.3	88.1	87.9	81.5	80.8	66.3	86.5	810
Morocco	16.9	37.7	6.1	9.7	33.3	68.0	14.6	18.6	11.8	27.5	16.3	21.2	6.9	9.1	5,197
Pakistan	15.3	37.0	5.8	8.7	20.9	53.5	12.6	17.0	8.1	19.8	18.3	16.9	12.3	10.0	6,492
Philippines	69.9	75.6	64.5	43.4	59.5	78.9	66.5	71.1	66.1	77.2	71.2	73.2	58.4	60.5	8,859
Turkey	43.9	55.8	26.2	17.1	48.4	81.2	44.5	45.5	26.2	58.4	35.8	48.2	9.5	18.6	3,736
LATIN AMERICA/ CARIBBEAN															
Bolivia	38.2	55.0	19.8	10.3	26.8	63.8	35.8	41.3	26.6	49.0	41.2	43.9	23.8	23.4	3,615
Brazil	80.1	86.4	60.9	45.7	72.2	90.5	76.7	82.0	73.8	87.2	69.7	86.3	42.2	62.2	4,782
Colombia	76.6	85.7	60.2	32.5	65.7	90.6	71.5	78.9	69.8	85.6	66.5	81.9	39.1	53.8	5,050
Dominican Republic	89.5	93.1	84.4	69.6	87.8	96.5	88.0	90.6	81.8	94.4	86.9	91.0	83.3	77.6	3,848
Guatemala	74.3	79.6	71.7	66.7	76.5	89.2	73.7	75.2	70.7	78.6	75.2	77.4	67.4	68.8	9,150
Haiti	49.8	67.8	41.2	32.7	61.3	82.7	49.4	52.1	41.8	62.1	51.1	51.6	37.8	39.5	3,624
Paraguay	75.5	86.3	66.3	42.6	70.7	93.6	73.9	77.8	66.9	84.1	78.4	81.1	58.3	63.7	3,975
Peru	53.5	70.3	27.5	21.7	34.8	76.8	47.7	55.6	48.3	68.0	50.4	58.0	29.0	37.2	8,540

U = Unknown (not available)

Table 2.4 shows the percentage of recent live births for which women received tetanus toxoid immunizations during pregnancy, according to residence, education, maternal age, birth order, and interval. The proportion of births for which women reported receiving at least one tetanus toxoid injection ranged from more than 85 percent in Kenya, Malawi, Rwanda, Tanzania, Kazakhstan, and the Dominican Republic, to less than 30 percent in Niger. Immunization coverage was higher in urban areas than in rural areas in 28 of the countries, and, with the exception of Guatemala, births to women with no education had the lowest coverage in all of the countries surveyed. Though there was little difference in tetanus coverage by maternal age, in three out of four countries, births to women in the older age group were less likely to be protected by immunization. Though in most countries differences were very small, in three out of five of the countries surveyed, coverage was highest among births to women having their first birth and in three-fourths of the countries it was lowest among births of order five or higher occurring within 24 months of the last birth. As for antenatal care, overall coverage of tetanus toxoid did not differ among the global regions when viewed as a whole.

Table 2.5 presents the percent distribution of births according to the number of tetanus toxoid injections received by the woman during pregnancy. With the exception of Zambia and Jordan, women reporting immunization with tetanus toxoid were more likely to have had two or more doses.

2.3 MISSED OPPORTUNITIES FOR IMMUNIZATION

Tetanus toxoid ideally should be a routine component of antenatal care. However, according to the DHS data, many women who saw a doctor, nurse, or midwife for an antenatal visit reported that they did not receive a tetanus toxoid injection at all during pregnancy. While this could be due to underreporting of tetanus toxoid injections, it seems unlikely that women would selectively underreport tetanus toxoid immunization in this manner. It also seems unlikely that all of these women were already fully immunized and therefore did not need tetanus toxoid injection. Another explanation could be that these represent true missed opportunities for immunization. Table 2.6 shows tetanus toxoid coverage among women who received antenatal care and gives an estimate of the magnitude of this problem. In a third of the countries, including Madagascar, Namibia, Niger, Egypt, Jordan, Morocco, Pakistan, Turkey, Bolivia, Brazil, Guatemala, and Peru, more than one-fourth of the births to women who received antenatal care were not immunized against tetanus toxoid during pregnancy.

2.4 DELIVERY CARE

Another aspect of maternal health care is that of delivery care. Most nonabortion maternal deaths happen around the time of labor and delivery, or within the first few days after birth (Bhatia, 1993; Fauveau et al., 1988; Kane et al., 1992; Kwast et al., 1986). Many potentially fatal complications occur to women who do not fall into any of the traditional high-risk groups and are therefore difficult to predict and/or prevent (Freedman and Maine, 1992). In such cases, access to services

where obstetric complications can be managed is essential in preventing maternal death. While in many settings the majority of births occur at home, prompt recognition and referral of the women who experience complications can be lifesaving. Attendance by a medically trained person during labor and delivery can facilitate such referral and is one goal of the safe motherhood initiative.

Table 2.7 shows the percentage of births where the woman was attended by either a doctor, a nurse, or a midwife during delivery by selected background characteristics of the woman. The percent attended by a medically trained person ranged from less than 20 in Niger, Bangladesh, and Pakistan to 80 and above in Jordan, Kazakhstan, Brazil, Colombia, the Dominican Republic, and Peru. The Latin American region has higher coverage overall for delivery care compared with other global regions; this is consistent with the lower levels of maternal mortality seen in most Latin American settings. As with antenatal care, women in rural areas in all countries surveyed were less likely to receive such delivery care. What is striking, however, is the level of this difference, which is much greater for delivery care than for antenatal care. For example, in half of the countries, women in urban areas were more than twice as likely to be assisted at birth by a trained attendant than were rural women. However, this level of difference is only seen in Niger for antenatal care (Table 2.4). Increasing use of trained providers among women with increasing levels of education was seen in all countries except Kazakhstan, where virtually all women were attended regardless of education. Maternal age, on the other hand, shows a less consistent pattern, with differences in use between the oldest and youngest age groups ranging from less than 4 percentage points in Cameroon, Niger, Senegal, Bangladesh, Kazakhstan, the Philippines, and Peru, to greater than 15 percentage points in Kenya, Namibia, Rwanda, India, Turkey, and Bolivia. In 9 out of 10 countries, the higher risk fifth or greater order and short interval births were least likely to be delivered by a trained attendant.

Another indicator of service coverage is the proportion of births where the woman delivered in a health facility where obstetric complications can be managed (Koblinsky et al., 1995; Maine et al., 1995). The DHS collected data on percent of births in facilities (including clinics, health centers, maternities, and hospitals), which have a distribution very similar to the proportion delivering with a trained attendant. Table 2.8 shows that the percent of births occurring in a facility ranged from less than 20 in Niger, Bangladesh, Indonesia, Pakistan, and Haiti to more than 75 in Jordan, Kazakhstan, Brazil, Colombia, and the Dominican Republic. Births to women in urban areas were more likely to occur in facilities in all countries. In 22 countries, urban women were two or more times more likely to deliver in a facility than rural women. The percent of births in facilities increases with increasing levels of education in all countries except Kazakhstan, with a low of 0.7 percent among women with no education in Bangladesh to a high of 98 percent among those with secondary or higher levels of education in Kazakhstan. There were no large differences and no clear pattern by maternal age. In nine of ten countries, fifth or higher order, short interval births were least likely to occur in a facility.

Table 2.4 Differentials in tetanus toxoid coverage

Percentage of recent live births for which women received at least one tetanus toxoid injection during pregnancy, by residence, level of education, maternal age and birth order/birth interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births for which TT was received	Residence		Highest educational level		Maternal age at birth			Birth order/interval					Number of births	
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24				
											2-4	<24	5+, <24		5+, <24
SUB-SAHARAN AFRICA															
Burkina Faso	37.2	72.6	31.3	33.6	61.6	77.0	34.9	38.9	32.3	38.9	35.7	40.6	29.0	34.4	6,366
Burkina Faso	64.9	92.2	60.3	62.3	82.3	91.7	57.9	66.5	65.3	59.1	62.2	67.9	62.7	65.7	6,366
Cameroon	70.7	83.1	62.8	51.4	84.2	87.2	72.5	70.8	66.8	77.4	71.7	74.6	58.5	65.1	3,488
Central African Republic	69.7	81.9	61.2	59.9	76.9	86.1	73.4	70.1	60.2	73.2	75.6	69.1	68.6	65.8	2,837
Cote d'Ivoire	75.3	88.2	68.7	69.2	84.7	94.7	77.8	75.0	72.2	82.3	73.4	76.6	66.8	70.7	3,989
Ghana	78.4	91.2	73.4	68.4	83.9	95.1	75.9	80.7	69.8	81.9	71.7	80.6	74.0	74.0	2,204
Kenya	91.3	95.2	90.7	86.3	91.4	95.3	90.0	92.0	89.1	92.0	92.7	91.8	88.9	90.3	6,128
Madagascar	60.1	72.2	58.3	49.4	60.0	71.1	57.7	60.9	59.6	63.8	58.9	60.6	56.7	59.0	5,683
Malawi	87.0	U	U	82.6	91.5	93.8	89.9	88.4	79.4	89.5	90.1	89.3	81.2	83.8	4,574
Namibia	64.1	59.5	66.4	49.6	68.9	84.5	61.1	64.4	66.0	61.5	61.9	65.3	65.7	65.9	3,859
Niger	23.8	76.8	14.2	20.9	45.9	84.5	22.8	24.6	20.8	25.0	24.6	25.9	19.4	22.6	7,207
Nigeria	54.6	78.3	48.2	42.9	70.1	82.8	46.4	57.4	49.9	56.7	57.4	54.8	47.0	54.4	8,205
Rwanda	90.8	91.0	90.8	89.1	92.1	95.1	91.5	91.6	87.9	93.8	93.1	92.6	87.4	87.7	5,662
Senegal	71.4	88.6	62.7	67.3	88.7	91.3	66.8	73.0	69.6	73.6	73.3	73.0	67.5	69.2	5,645
Tanzania	90.5	93.4	89.8	86.2	92.8	95.2	92.6	90.7	87.1	93.6	87.2	92.0	87.1	88.0	8,117
Uganda	80.5	85.4	79.9	74.0	82.7	87.6	83.0	80.8	73.9	85.3	82.2	81.9	76.0	76.0	6,027
Zambia	81.9	87.8	76.7	68.0	83.3	89.2	81.2	82.7	78.5	82.0	82.0	82.2	81.3	81.4	6,279
Zimbabwe	83.3	85.8	82.5	79.7	81.8	86.7	88.7	83.7	74.1	88.0	81.1	86.2	74.2	75.6	2,364
ASIA/NEAR EAST/ NORTH AFRICA															
Bangladesh	66.2	81.3	64.6	58.2	70.1	89.1	74.9	64.7	46.2	78.6	64.1	66.7	48.8	53.0	3,926
Egypt	70.3	67.6	71.9	66.4	71.7	74.7	75.9	71.3	56.8	77.9	73.0	71.9	58.5	60.0	11,454
India	61.8	81.2	56.1	49.2	79.7	93.6	64.0	62.8	38.6	72.7	66.0	62.6	44.2	41.0	50,001
Indonesia	66.6	79.1	61.8	41.4	65.2	80.2	67.9	68.0	56.1	74.7	58.5	70.2	44.2	52.8	16,983
Jordan	44.2	45.3	41.6	37.2	45.2	46.2	55.6	43.1	42.9	59.8	38.1	45.8	37.0	44.3	8,261
Morocco	54.2	57.3	52.6	53.2	62.3	54.7	42.7	53.4	61.7	45.2	48.0	58.8	47.4	59.7	5,197
Pakistan	31.9	54.3	21.9	24.5	45.8	67.9	30.6	33.5	24.0	37.3	35.6	32.8	30.0	25.7	6,492
Philippines	65.4	64.3	66.4	27.8	61.3	70.2	67.4	65.9	61.9	68.5	66.3	67.8	58.1	60.7	8,859
Turkey	43.0	46.0	38.6	26.8	50.7	48.9	45.0	44.4	25.0	50.6	41.8	45.5	21.5	27.4	3,736
LATIN AMERICA/ CARIBBEAN															
Bolivia	41.6	52.8	29.2	21.0	36.3	56.4	40.9	43.2	34.9	41.7	39.7	45.8	42.5	36.5	3,615
Brazil	63.5	64.4	60.6	56.3	62.1	65.5	69.2	61.9	63.3	73.5	49.7	61.9	48.5	60.6	4,782
Colombia	81.1	80.4	82.2	71.0	82.4	80.9	81.6	81.7	76.0	81.6	82.3	81.6	75.5	77.5	5,050
Dominican Republic	91.7	93.4	89.4	79.6	90.5	96.2	89.5	93.4	79.6	94.5	90.0	92.4	86.8	86.6	3,848
Guatemala	56.0	54.8	56.5	52.0	60.3	51.6	56.3	56.2	54.2	54.1	57.7	57.3	53.8	55.8	9,150
Haiti	66.9	73.3	63.8	58.6	74.5	75.6	67.8	69.1	57.9	74.3	67.7	68.4	55.0	61.3	3,624
Paraguay	84.7	92.1	78.4	48.1	82.4	96.2	81.5	86.3	80.3	91.2	83.8	88.6	74.7	77.1	3,975
Peru	36.2	42.5	26.7	21.7	31.7	43.4	38.9	36.8	31.2	41.0	34.0	38.1	29.2	30.9	8,540

U = Unknown (not available)

Table 2.5 Number of tetanus toxoid doses received during pregnancy

Percent distribution of recent births by number of tetanus toxoid injections the mother received during pregnancy, Demographic and Health Surveys, 1990-1996

Country	Percent of births for which TT received	Number tetanus toxoid doses				Number of births
		0	1	2+	DK/missing	
SUB-SAHARAN AFRICA						
Burkina	64.9	35.1	20.4	41.6	2.8	6,366
Cameroon	70.7	29.3	21.8	47.3	1.6	3,488
Central African Republic	69.7	30.3	19.6	50.0	0.2	2,837
Cote d'Ivoire	75.3	24.7	27.5	47.3	0.4	3,989
Ghana	78.4	21.6	25.4	51.2	1.8	2,204
Kenya	91.3	8.7	37.5	51.7	2.1	6,128
Madagascar	60.1	39.9	14.5	43.9	1.8	5,683
Malawi	87.0	13.0	13.1	72.5	1.4	4,574
Namibia	64.1	35.9	28.4	32.6	3.2	3,859
Niger	23.8	76.2	9.0	14.0	0.8	7,207
Nigeria	54.6	45.4	11.3	40.9	2.4	8,205
Rwanda	90.8	9.2	29.7	59.5	1.6	5,662
Senegal	71.4	28.6	17.6	52.5	1.3	5,645
Tanzania	90.5	9.5	17.9	71.5	1.2	8,117
Uganda	80.5	19.5	26.3	53.7	0.5	6,027
Zambia	81.9	18.1	41.8	39.0	1.1	6,279
Zimbabwe	83.3	16.7	36.1	46.0	1.3	2,364
ASIA/NEAR EAST/ NORTH AFRICA						
Bangladesh	66.2	33.8	16.8	49.1	0.4	3,926
Egypt	70.3	29.7	26.4	43.1	0.8	11,454
India	61.8	38.2	7.2	53.7	0.9	50,001
Indonesia	66.6	33.4	16.5	48.8	1.3	16,983
Jordan	44.2	55.8	22.4	20.2	1.7	8,261
Morocco	54.2	45.8	8.3	45.7	0.2	5,197
Pakistan	31.9	68.1	6.5	23.3	2.1	6,492
Philippines	65.4	34.6	22.3	42.1	1.0	8,859
Turkey	43.0	57.0	15.7	26.4	0.9	3,736
LATIN AMERICA/ CARIBBEAN						
Bolivia	41.6	58.4	19.4	21.4	0.8	3,615
Brazil	63.5	36.5	13.2	45.3	5.0	4,782
Colombia	81.1	18.9	23.6	56.5	1.0	5,050
Dominican Republic	91.7	8.3	13.3	77.6	0.9	3,848
Guatemala	56.0	44.0	16.7	37.9	1.4	9,150
Haiti	66.9	33.1	16.5	49.3	1.1	3,624
Paraguay	84.7	15.3	17.0	66.9	0.7	3,975
Peru	36.2	63.8	15.1	20.2	1.0	8,540

In Madagascar, Egypt, Indonesia, the Philippines, Turkey, Haiti, Paraguay, and Peru, the percent of births where a trained person attended the delivery was more than 10 percentage points higher than the percent reported as occurring in a facility. This may reflect efforts to increase the proportion of home births that are attended by a trained person. In settings where this is not the case, this finding may raise questions about the data regarding attendants reported as a doctor, nurse, or trained midwife.

Table 2.9 presents the distribution of births according to whether women received care from a medically trained person (doctor, nurse, or midwife) both antenatally and during delivery,

only antenatally, or during delivery exclusively, or neither. It may be speculated that perhaps the cases where both antenatal and delivery care were received may include births to women who were low risk but routinely use health services as well as births to women who were referred for delivery care because of their high-risk status. The group of births where the woman only received antenatal care may include women who were screened and found to have low or no risk as well as women who, for any number of reasons, have no access to delivery care. Women who received care only at the time of delivery may have been those with little access to services or those who had no problems until the onset of labor when they then sought help because of complications.

Table 2.6 Missed opportunity for tetanus toxoid immunization

Percent distribution of tetanus toxoid (TT) immunization among women who received antenatal care (ANC) for recent live births, Demographic and Health Surveys, 1990-1996

Country	Among births receiving ANC			Total births w/ANC
	Percent receiving any TT	Percent receiving no TT	DK/ missing	
SUB-SAHARAN AFRICA				
Burkina	80.7	16.8	2.6	3,726
Cameroon	84.8	13.3	1.9	2,743
Central African Rep.	85.2	14.7	0.1	1,898
Cote d'Ivoire	88.1	11.5	0.4	3,320
Ghana	87.1	11.5	1.4	1,886
Kenya	93.4	5.4	1.2	5,807
Madagascar	69.8	29.0	1.1	4,430
Malawi	93.5	5.3	1.1	4,122
Namibia	66.9	30.4	2.8	3,362
Niger	67.6	31.1	1.3	2,158
Nigeria	83.1	14.2	2.7	4,826
Rwanda	93.8	5.2	0.9	5,346
Senegal	86.2	12.3	1.4	4,154
Tanzania	92.2	6.9	0.9	7,449
Uganda	85.8	14.0	0.2	5,496
Zambia	86.5	12.7	0.8	5,790
Zimbabwe	88.1	10.8	1.2	2,201
ASIA/NEAR EAST/ NORTH AFRICA				
Bangladesh	90.0	9.3	0.6	1,017
Egypt	73.3	25.7	1.0	4,482
India	94.3	5.3	0.4	24,585
Indonesia	78.3	20.5	1.2	13,975
Jordan	46.1	52.3	1.6	6,630
Morocco	61.1	38.5	0.4	1,674
Pakistan	68.5	30.9	0.6	1,655
Philippines	75.4	23.7	0.9	7,359
Turkey	55.9	43.0	1.1	2,334
LATIN AMERICA/ CARIBBEAN				
Bolivia	57.2	42.0	0.8	1,897
Brazil	63.3	32.7	4.1	4,094
Colombia	84.1	15.0	0.9	4,167
Dominican Republic	93.2	6.0	0.8	3,725
Guatemala	68.5	30.1	1.4	4,803
Haiti	84.5	14.2	1.3	2,452
Paraguay	93.4	5.9	0.7	3,336
Peru	47.2	51.6	1.2	5,645

In general, in countries where the overall coverage of delivery was high (Table 2.7), the percentage of births receiving both antenatal and delivery care was also high (Table 2.9), because most women receiving delivery care were also seen antenatally. The only countries where more than 10 percent of the births received only delivery care were Brazil, Egypt, Jordan, Morocco, Turkey, Brazil, and Peru.

2.5 CAESAREAN SECTION DELIVERIES

Women were also asked, for each recent live birth, whether or not they had a caesarean section. Such surgical delivery, when indicated, can be lifesaving for both the woman and her child. In many developing country settings, it is most often used to manage obstructed labor. Access and availability of this procedure for women in need are major determinants of its impact on maternal mortality. It is estimated that at a minimum, five percent of all deliveries will need to be done surgically to prevent maternal morbidity and mortality. It has also been suggested that rates above 15 percent may indicate excessive use of the procedure (Koblinsky et al., 1995 and Maine et al., 1995). DHS data do not allow assessment of the appropriateness of surgery, but can give some indication of access among different subgroups of the population.

The percent of births by caesarean section ranged from around 1-2 percent in Burkina Faso, Central Africa Republic (CAR), Ivory Coast, Madagascar, Niger, Rwanda, Morocco, and Haiti to greater than 15 percent in Brazil, Colombia, and the Dominican Republic (Table 2.10). The extremely high rates of surgical delivery seen in Brazil are thought by some to reflect efforts to increase access to sterilization (Potter et al., 1996). A higher percentage of women in the Latin American countries reported having a caesarean birth, compared with other regions surveyed. Not surprisingly, the percent of births delivered by caesarean section was greater in urban areas in all countries. With the exception of Madagascar and Kazakstan, the percent of surgical deliveries increases with increasing levels of maternal education which, like residence, reflects access to care. There was no clear pattern of differences by maternal age. In all sub-Saharan African countries, and all other countries except Kazakstan, Brazil, and Paraguay, the highest percentage of surgical deliveries was among first births. This is not surprising, since surgical delivery for obstructed labor is more likely to be indicated in very young women with bony pelvic structures that are not mature, and births to the very young are also more likely to be first births.

2.6 PREMATURITY AND LOW BIRTH WEIGHT

Premature birth and low birth weight are both associated with higher morbidity and mortality during infancy (Fauveau et al., 1990; McCormick, 1985). In DHS-II, an attempt was made to determine, for each recent live birth, whether or not the baby was born on time or prematurely by asking the mother "was (NAME) born on time or prematurely?" The percent of births women reported as premature ranged from less than 1 percent in Niger and Morocco to 12 percent in Jordan (Table 2.11). The quality of reporting on prematurity is somewhat questionable given the distribution for reported prematurity compared with that for other indicators from the countries surveyed. This is not surprising given the difficulties of estimating gestational age. Further questions are raised about data quality by the differentials shown in Table 2.11 where, in most countries, urban births and births to the most educated respondents have the highest reported percentage of premature births.

Table 2.7 Differentials in delivery coverage

Percentage of recent live births for which women received delivery care from a medically trained person, by residence, level of education, maternal age and birth order/birth interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births for which delivery care was received	Residence		Highest educational level			Maternal age at birth			Birth order/interval				Number of births	
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+	5+, <24		5+, 24+
SUB-SAHARAN AFRICA															
Burkina Faso	41.4	91.6	33.0	37.0	70.1	92.0	42.9	41.8	37.9	47.9	37.8	43.0	34.5	37.9	6,366
Cameroon	63.5	83.3	50.9	35.7	81.1	90.5	62.0	64.6	60.8	72.8	62.9	66.8	47.1	58.8	3,488
Central African Republic	45.9	77.8	23.7	29.4	54.0	84.8	50.5	45.8	38.0	50.7	45.3	45.1	50.1	42.3	2,837
Cote d'Ivoire	45.4	76.3	29.6	36.9	55.4	81.4	48.7	45.1	41.7	56.3	44.0	45.0	30.5	41.6	3,989
Ghana	43.7	80.8	29.4	23.9	54.1	84.4	47.6	45.0	34.9	56.2	43.5	44.1	30.1	35.1	2,204
Kenya	45.1	79.7	40.1	22.4	42.3	73.1	50.9	46.5	30.3	61.6	47.9	48.0	30.2	33.3	6,128
Madagascar	56.7	82.9	52.8	38.4	55.4	78.7	52.2	58.0	56.7	62.1	56.0	58.7	51.7	53.3	5,683
Malawi	54.9	U	U	44.7	64.0	91.1	57.1	56.9	46.1	60.5	55.7	56.6	49.0	51.3	4,574
Namibia	68.2	86.2	59.4	42.7	63.8	89.5	75.7	70.1	55.0	81.1	68.2	69.3	58.7	54.2	3,859
Niger	14.9	69.9	4.9	12.1	34.8	82.4	14.0	14.8	16.5	17.3	13.1	15.7	11.6	14.8	7,207
Nigeria	33.0	60.8	25.6	17.4	50.4	78.4	25.4	35.0	32.1	37.0	35.6	31.4	29.5	32.5	8,205
Rwanda	25.9	67.1	23.7	18.5	28.7	65.5	42.4	26.5	17.7	51.6	25.0	22.8	17.1	16.9	5,662
Senegal	47.2	84.1	28.5	39.5	76.9	92.7	44.8	48.1	45.9	57.9	51.2	46.6	40.5	43.1	5,645
Tanzania	53.1	85.7	44.7	37.9	60.3	83.7	56.5	53.2	48.4	62.4	49.1	53.2	40.0	49.4	8,117
Uganda	37.8	78.8	32.3	20.6	40.4	73.2	44.1	36.8	30.6	49.4	41.6	36.0	35.2	30.3	6,027
Zambia	50.4	79.0	25.6	21.6	48.0	82.8	50.2	52.0	42.5	57.6	50.0	49.4	46.0	47.2	6,279
Zimbabwe	69.4	91.1	61.7	42.0	62.7	87.5	71.4	71.0	57.8	79.1	61.5	72.5	39.8	59.0	2,364
ASIA/NEAR EAST/ NORTH AFRICA															
Bangladesh	9.5	34.8	6.7	4.5	6.7	32.8	9.1	9.9	6.6	14.1	8.8	8.9	4.5	5.9	3,926
Egypt	46.2	67.9	32.8	27.9	43.9	73.4	40.5	46.9	48.2	64.0	42.1	48.4	26.8	30.3	11,454
India	34.3	65.5	25.1	20.1	48.7	75.6	34.4	35.4	19.5	48.2	35.0	32.9	16.0	17.1	50,001
Indonesia	39.8	76.4	26.0	11.3	29.1	75.3	27.4	43.1	34.2	47.2	40.6	40.7	27.8	27.4	16,983
Jordan	87.3	90.1	80.8	71.6	84.3	93.6	91.2	87.3	84.9	95.4	89.0	89.2	82.0	83.7	8,261
Kazakhstan	99.6	100.0	99.3	100.0	99.6	100.0	99.5	100.0	100.0	99.2	99.6	100.0	97.9	81.0	5,197
Morocco	30.8	63.6	13.8	20.6	64.4	91.3	35.9	32.4	22.8	52.7	27.9	35.3	13.8	18.8	6,492
Pakistan	18.6	42.3	8.1	11.0	25.2	62.3	16.9	19.9	12.6	25.1	21.8	18.6	17.7	12.6	8,859
Philippines	52.8	70.5	36.1	9.2	34.6	68.4	48.9	54.0	49.5	66.5	55.6	53.6	37.8	40.2	8,859
Turkey	76.0	87.2	59.3	49.9	84.7	97.9	77.0	77.5	58.3	89.8	71.4	80.2	34.9	51.7	3,736
LATIN AMERICA/ CARIBBEAN															
Bolivia	47.1	66.0	26.2	12.3	35.0	76.1	52.8	48.7	35.2	64.0	49.7	51.8	32.2	28.0	3,615
Brazil	87.7	92.3	73.3	65.9	82.2	94.5	88.1	88.5	80.6	93.2	83.2	91.2	60.9	71.5	4,782
Colombia	84.5	92.8	69.7	55.6	75.1	95.7	87.4	85.0	76.5	93.7	78.2	87.1	57.0	61.7	5,050
Dominican Republic	92.5	97.9	84.6	72.0	91.4	98.6	94.3	92.8	83.7	97.3	94.1	92.3	79.2	80.9	3,848
Guatemala	34.8	63.4	21.1	15.0	36.3	89.8	35.3	36.2	26.9	51.7	36.9	39.2	16.6	20.5	9,150
Haiti	46.3	66.9	36.4	32.3	53.1	81.7	49.1	47.4	40.3	58.5	46.2	46.0	39.0	37.8	3,624
Paraguay	66.0	87.0	48.3	32.3	57.9	93.5	66.4	67.3	60.2	80.6	64.4	75.3	41.5	49.4	3,975
Peru	80.0	91.1	62.9	55.6	70.8	93.5	78.9	80.8	76.9	88.8	79.5	82.5	69.7	68.3	8,540

U = Unknown (not available)

Table 2.8 Deliveries that occurred in a health facility

Percentage of recent live births delivered in a health facility, by residence, level of education, maternal age and birth order/birth interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births in health facility	Residence		Highest educational level			Maternal age at birth			Birth order/interval					Number of births	
		Urban	Rural	None	Primary	Secondary+ Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+	5+, <24	5+, 24+		
SUB-SAHARAN AFRICA																
Burkina Faso	42.9	90.7	35.0	38.7	70.6	90.9	46.0	42.8	40.3	49.5	41.8	44.0	44.0	34.1	39.9	6,366
Cameroon	62.2	82.0	49.5	34.6	79.4	89.3	60.4	63.3	59.5	70.8	62.7	65.7	65.7	45.8	57.1	3,488
Central African Republic	49.8	78.2	29.9	34.9	57.5	83.4	53.0	50.1	41.8	54.4	48.3	49.5	48.7	47.1	2,837	
Cote d'Ivoire	44.8	75.6	29.1	36.6	54.0	81.4	47.2	44.9	40.5	55.6	42.1	44.4	44.4	30.1	41.4	3,989
Ghana	42.1	79.0	27.9	22.3	52.3	83.6	44.9	43.4	34.0	53.9	41.3	43.4	24.7	33.0	2,204	
Kenya	43.8	77.4	38.9	21.5	41.1	71.1	48.7	45.1	30.4	59.2	46.6	46.3	30.2	32.9	6,128	
Madagascar	44.7	53.7	43.3	32.1	45.9	53.7	43.0	45.0	45.1	49.1	43.6	44.9	42.9	42.5	5,683	
Malawi	55.3	U	U	44.7	64.9	90.5	57.5	57.4	46.0	61.8	55.7	56.8	48.7	51.6	4,574	
Namibia	66.9	85.6	57.8	41.5	62.4	88.4	74.5	68.5	54.4	80.4	65.6	67.7	58.5	52.7	3,859	
Niger	15.4	73.0	5.0	12.5	36.5	81.3	14.9	15.5	15.8	18.1	13.6	15.9	15.9	12.9	7,207	
Nigeria	32.4	62.1	24.5	16.2	49.8	80.8	24.5	34.5	31.4	35.9	35.4	30.4	29.9	32.1	8,205	
Rwanda	25.5	67.0	23.3	17.7	28.7	65.9	41.8	26.2	17.1	50.9	25.1	22.4	16.3	16.6	5,662	
Senegal	46.9	81.2	29.4	39.1	76.4	92.7	44.1	47.8	45.7	58.1	49.6	46.2	40.7	42.6	5,645	
Tanzania	53.3	85.7	45.0	38.6	60.4	81.3	57.3	53.3	48.3	63.1	48.8	54.0	38.8	49.1	8,117	
Uganda	35.4	76.2	30.0	18.6	38.1	69.6	42.0	34.2	29.4	47.6	40.4	32.6	32.2	28.3	6,027	
Zambia	50.6	78.8	26.2	22.3	48.1	82.9	50.3	52.1	43.0	57.8	50.5	49.7	45.7	47.3	6,279	
Zimbabwe	69.1	90.9	61.4	39.6	62.7	87.6	71.7	70.6	57.3	79.7	61.5	71.9	58.4	58.4	2,364	
ASIA/NEAR EAST/ NORTH AFRICA																
Bangladesh	3.5	19.9	1.6	0.7	2.4	15.9	3.0	3.7	2.7	6.2	4.1	3.0	3.0	-	1.4	3,926
Egypt	32.5	54.7	18.7	17.3	30.8	54.7	26.2	32.8	37.4	49.1	26.2	33.3	33.3	17.5	20.3	11,454
India	25.5	57.7	16.0	11.8	37.9	66.8	23.9	26.9	12.6	38.2	26.0	23.9	23.9	9.9	10.4	50,001
Indonesia	17.5	42.8	7.9	4.0	9.2	41.2	9.5	19.4	15.0	23.3	18.1	17.6	17.6	9.0	8.9	16,983
Jordan	78.5	81.6	71.4	62.9	74.9	85.1	82.2	78.3	77.4	88.8	79.8	80.7	80.7	72.3	74.6	8,261
Kazakhstan	98.4	99.9	97.3	-	100.0	98.4	100.0	98.2	97.3	99.7	96.9	98.2	98.2	100.0	95.3	810
Morocco	28.3	58.6	12.6	18.9	58.4	84.4	33.3	29.7	21.1	49.2	26.4	31.5	31.5	12.9	17.3	5,197
Pakistan	13.3	32.7	4.7	6.7	17.2	52.8	10.8	14.6	8.0	19.7	17.2	13.3	13.3	10.9	7.4	6,492
Philippines	28.3	43.6	13.8	3.9	12.3	41.2	25.7	29.6	23.5	44.5	30.2	28.5	28.5	11.5	15.2	8,859
Turkey	59.8	72.7	40.5	30.6	68.6	87.1	61.9	60.7	46.2	77.8	52.6	61.0	61.0	24.2	33.4	3,736
LATIN AMERICA/ CARIBBEAN																
Bolivia	42.2	61.5	20.9	9.9	29.6	71.0	47.2	44.0	30.4	58.6	45.5	46.9	46.9	27.1	23.5	3,615
Brazil	91.5	95.9	78.2	71.3	87.5	97.2	93.2	92.1	84.1	96.8	88.9	94.2	94.2	66.8	76.6	4,782
Colombia	76.8	88.5	56.0	40.5	64.2	91.5	77.2	78.2	67.0	89.3	68.4	79.7	79.7	42.7	46.5	5,050
Dominican Republic	92.0	97.3	84.4	73.2	91.1	97.6	94.3	92.2	83.1	97.3	94.5	90.8	90.8	77.3	81.4	3,848
Guatemala	34.3	62.5	20.8	15.1	35.6	88.4	35.2	35.7	26.2	50.4	36.6	38.8	38.8	17.5	20.1	9,150
Haiti	16.4	35.1	7.4	5.6	18.0	55.7	22.4	16.9	10.0	31.9	14.9	15.2	15.2	7.8	7.1	3,624
Paraguay	53.3	78.4	32.2	20.0	43.3	86.3	54.3	54.6	47.0	70.6	50.0	63.7	63.7	28.1	33.7	3,975
Peru	48.4	69.4	16.1	14.1	27.0	74.6	46.1	49.9	43.2	66.0	44.9	52.6	52.6	25.7	28.5	8,540

U = Unknown (not available)

Table 2.9 Antenatal care and/or delivery care

Percent distribution of recent live births for which the mother received antenatal care (ANC) and/or delivery care (DC) from a medically trained person during pregnancy, Demographic and Health Surveys, 1990-1996

Country	Both ANC and DC	ANC only	DC only	Neither ANC nor DC	Number of births
SUB-SAHARAN AFRICA					
Burkina	39.0	19.5	2.4	39.1	6,366
Cameroon	62.2	16.4	1.3	20.0	3,488
Central African Republic	43.7	23.2	2.3	30.8	2,837
Cote d'Ivoire	44.5	38.7	0.9	15.9	3,989
Ghana	42.5	43.1	1.3	13.2	2,204
Kenya	44.4	50.3	0.7	4.5	6,128
Madagascar	53.9	24.1	2.8	19.2	5,683
Malawi	54.3	35.8	0.6	9.2	4,574
Namibia	64.3	22.8	4.0	8.9	3,859
Niger	13.7	16.2	1.1	68.9	7,207
Nigeria	32.0	26.9	1.1	40.1	8,205
Rwanda	25.5	68.9	0.4	5.2	5,662
Senegal	44.2	29.4	3.0	23.4	5,645
Tanzania	51.9	39.9	1.2	7.0	8,117
Uganda	37.0	54.1	0.7	8.1	6,027
Zambia	50.1	42.1	0.3	7.5	6,279
Zimbabwe	68.8	24.3	0.6	6.3	2,364
ASIA/NEAR EAST/ NORTH AFRICA					
Bangladesh	5.8	20.0	3.6	70.5	3,926
Egypt	27.8	11.3	18.4	42.4	11,454
India	27.5	21.7	6.8	44.0	50,001
Indonesia	38.6	43.7	1.2	16.5	16,983
Jordan	72.8	7.4	14.4	5.3	8,261
Kazakhstan	92.1	0.4	7.5	0.0	810
Morocco	19.9	12.4	10.9	56.8	5,197
Pakistan	13.7	11.7	4.9	69.6	6,492
Philippines	50.2	32.9	2.6	14.3	8,859
Turkey	56.4	6.1	19.6	17.9	3,736
LATIN AMERICA/ CARIBBEAN					
Bolivia	38.7	13.8	8.4	39.1	3,615
Brazil	79.5	6.1	8.1	6.3	4,782
Colombia	74.8	7.7	9.7	7.8	5,050
Dominican Republic	90.7	6.1	1.8	1.4	3,848
Guatemala	28.2	24.3	6.6	40.9	9,150
Haiti	37.8	29.8	8.4	23.9	3,624
Paraguay	63.2	20.7	2.8	13.3	3,975
Peru	59.4	6.7	20.6	13.3	8,540

In both DHS-II and DHS-III, women were asked to report on the birth weight of the baby, if the baby was weighed at birth. All respondents with recent births were asked about their perception of the child's size at birth. The percent of recent live births weighing less than 2.5 kg ranged from less than 6 percent in Bolivia to more than 15 percent in Madagascar, Pakistan, the Philippines, India, and Haiti (Table 2.12). This distribution is somewhat difficult to interpret because the distribution of all births that were weighed varied by country. The percent of births where the mother reported the child's size as being very small at birth ranged from less than 3 percent in Cameroon,

Kenya, Tanzania, Zambia, and Indonesia, to more than 10 percent in Niger, India, Guatemala, and Haiti (Table 2.13). Though differences are not large, in about two-thirds of the countries where this question was asked, the percent with very small size at birth was higher among rural births. In one out of two countries, births to women with no education were most likely to have reported a small size at birth. In all countries with this information, the percentage of small-sized births was highest for either the youngest or oldest maternal age groups. Likewise, the highest percentages by birth order were seen among the first and highest parity groups.

Table 2.10 Differentials in caesarean section delivery

Percentage of recent live births in which the child was delivered by caesarean section, by residence, level of education, maternal age and birth order/interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births by C-section	Residence		Highest educational level			Maternal age at birth			Birth order/interval					Number of births
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+	5+, <24	5+, 24+	
SUB-SAHARAN AFRICA															
Burkina	1.3	4.4	0.8	1.0	2.8	8.4	1.6	1.2	1.5	2.5	0.7	1.3	0.1	1.1	6,366
Cameroon	2.3	3.7	1.5	1.6	2.2	4.1	2.7	1.9	3.8	3.7	1.4	2.7	1.5	1.6	3,488
Central African Republic	1.9	2.3	1.6	1.2	2.1	3.5	1.9	1.9	1.3	2.7	0.4	1.6	0.8	2.3	2,837
Ivory Coast	1.8	3.2	1.0	1.2	2.6	3.8	2.0	1.7	1.8	3.1	1.1	1.1	2.0	1.7	3,989
Ghana	4.5	9.0	2.8	2.9	4.6	16.4	4.4	4.3	5.5	6.0	2.2	4.7	1.4	4.0	2,204
Kenya	5.2	11.1	4.3	2.9	4.6	8.8	6.1	5.3	3.2	8.5	4.8	4.9	2.6	3.9	6,128
Madagascar	1.0	1.9	0.8	1.3	0.6	1.7	0.9	1.0	1.1	1.6	0.6	0.8	1.0	0.9	5,683
Malawi	3.4	U	U	2.1	4.3	12.0	4.6	3.1	3.3	4.9	3.3	3.3	4.2	2.6	4,574
Namibia	6.6	9.8	5.0	4.1	5.9	9.1	8.9	6.3	5.8	9.3	6.6	6.7	2.2	4.6	3,859
Niger	0.9	2.1	0.6	0.8	1.2	4.0	1.5	0.6	1.1	1.7	0.8	0.9	0.4	0.7	7,207
Nigeria	2.5	3.3	2.3	1.9	2.8	5.1	1.7	2.8	2.3	2.9	2.2	2.9	1.2	2.5	8,205
Rwanda	1.7	4.7	1.6	1.4	1.8	4.2	3.5	1.7	1.2	3.8	1.1	1.7	0.6	1.1	5,662
Senegal	2.2	3.5	1.6	2.0	2.0	6.0	1.8	2.3	2.4	3.1	1.6	2.1	2.6	2.1	5,645
Tanzania	2.5	5.2	1.8	1.9	2.7	4.5	3.2	2.4	1.8	3.7	2.5	2.7	1.3	1.6	8,117
Uganda	2.6	6.6	2.1	1.3	2.9	5.0	3.0	2.8	1.0	4.1	2.5	2.4	3.4	1.7	6,027
Zambia	2.6	4.0	1.4	1.8	2.0	5.2	2.8	2.4	3.3	3.3	2.4	2.4	0.9	2.6	6,279
Zimbabwe	6.0	7.0	5.6	1.6	5.4	8.2	5.9	6.3	4.3	9.0	4.9	5.5	-	4.4	2,364
ASIA/NEAR EAST/ NORTH AFRICA															
Egypt	6.6	10.7	4.1	3.2	6.0	11.9	4.4	6.7	9.0	10.6	5.6	6.5	2.3	4.3	11,454
India	2.5	5.7	1.6	0.9	2.7	8.9	2.1	2.7	1.4	5.1	1.5	2.1	0.3	0.5	50,001
Indonesia	2.5	4.8	1.6	0.6	1.7	5.2	1.9	2.5	3.1	3.4	1.7	2.5	1.0	1.8	16,983
Jordan	5.6	6.4	4.0	5.6	5.6	5.7	4.5	5.0	9.1	8.3	4.1	5.4	4.6	6.3	8,261
Kazakhstan	4.6	7.2	2.7	-	19.7	4.6	2.2	4.8	6.9	4.9	3.1	5.7	-	2.1	810
Morocco	2.0	4.3	0.9	1.3	3.7	7.6	3.1	2.0	1.6	5.0	1.9	2.3	0.4	0.4	5,197
Pakistan	2.7	5.7	1.3	1.1	2.7	12.7	3.6	2.9	0.6	6.3	2.9	2.5	1.3	0.9	6,492
Philippines	5.9	7.6	4.3	1.3	3.1	8.2	4.7	5.8	6.9	9.9	5.8	6.1	2.3	2.6	8,859
Turkey	8.1	10.2	4.9	4.0	8.9	13.3	5.4	8.5	9.2	10.8	6.4	8.8	0.6	4.3	3,736
LATIN AMERICA/ CARIBBEAN															
Bolivia	10.6	14.8	5.9	2.4	7.3	18.0	10.1	11.1	8.5	17.0	7.9	12.5	3.2	5.8	3,615
Brazil	36.4	41.8	20.1	12.5	27.0	46.5	24.3	39.4	39.4	39.8	25.8	44.6	11.6	17.8	4,782
Colombia	16.9	20.7	10.1	5.2	10.9	23.4	10.3	17.5	24.4	20.9	12.1	18.8	4.4	7.9	5,050
Dominican Republic	22.3	26.9	15.7	10.3	16.2	33.9	15.6	24.2	20.8	27.9	21.7	23.3	5.3	11.3	3,848
Guatemala	8.2	16.0	4.4	3.0	7.7	25.4	8.2	8.4	7.1	13.1	9.2	9.6	3.3	3.4	9,150
Haiti	1.6	3.8	0.5	0.6	0.7	8.7	0.5	1.7	1.9	3.1	2.6	1.2	-	0.6	3,624
Paraguay	13.1	20.7	6.8	4.1	8.8	26.6	9.9	13.3	14.9	17.4	10.4	18.0	5.6	7.1	3,975
Peru	9.7	14.1	2.9	1.7	4.5	16.0	6.4	10.1	10.9	15.4	8.4	10.4	2.4	4.6	8,540

U = Unknown (not available)

Table 2.11 Differentials in premature delivery

Percentage of recent live births for which the mother reported that the birth was premature, by residence, level of education, maternal age and birth order/interval, Demographic and Health Surveys, 1990-1996

Country	Percent of premature births	Residence		Highest educational level			Maternal age at birth			Birth order/interval				Number of births	
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+	5+, <24		5+, 24+
SUB-SAHARAN AFRICA															
Burkina	2.1	2.6	2.0	2.0	2.0	5.3	3.9	1.9	0.8	4.2	2.0	1.7	2.4	1.2	6,366
Cameroon	2.1	2.4	2.0	2.2	1.5	3.0	2.9	1.7	2.9	2.6	3.3	1.1	4.4	2.0	3,488
Ghana	2.4	3.3	2.0	1.4	3.3		3.7	2.4	1.2	4.0	3.6	1.6	2.7	1.9	2,204
Kenya	3.6	5.0	3.4	3.0	3.3	5.0	5.4	3.2	3.7	5.6	2.5	2.8	3.3	3.6	6,128
Madagascar	2.5	3.6	2.3	1.9	2.0	4.4	3.5	2.4	1.7	4.3	4.5	1.6	1.8	1.5	5,683
Malawi	3.7	U	U	2.6	4.5	9.6	6.3	3.6	1.4	6.9	5.2	2.6	3.3	2.5	4,574
Namibia	4.7	5.0	4.6	1.6	4.7	6.6	7.1	4.3	4.2	6.8	6.3	3.8	2.3	3.8	3,859
Niger	0.9	1.1	0.9	0.9	0.9	2.2	1.9	0.6	0.7	2.1	1.2	0.5	0.5	0.8	7,207
Nigeria	1.6	1.7	1.5	1.4	1.8	2.3	2.0	1.4	1.8	3.0	1.8	0.8	1.8	1.4	8,205
Rwanda	2.2	2.8	2.2	2.1	2.3	2.1	1.8	2.3	2.1	2.1	3.4	2.1	3.3	1.8	5,662
Senegal	1.4	1.5	1.3	1.2	2.2	3.3	1.9	1.3	1.2	2.1	3.2	0.9	1.2	1.1	5,645
Tanzania	3.0	5.0	2.5	2.8	3.0	4.0	4.9	2.2	4.2	4.9	2.4	2.0	2.9	2.9	8,117
Zambia	5.0	5.6	4.4	3.0	4.7	7.3	8.3	4.4	2.2	8.3	6.6	4.3	5.9	2.5	6,279
ASIA/NEAR EAST/ NORTH AFRICA															
Egypt	2.9	3.9	2.2	1.9	2.8	4.9	3.0	2.8	2.9	4.7	2.8	2.6	2.1	1.9	8,697
India	3.2	3.9	3.0	2.9	3.1	4.4	4.6	2.8	2.5	4.8	3.9	2.4	1.8	2.1	50,001
Indonesia	2.7	4.0	2.2	1.7	2.2	4.2	4.9	2.3	2.7	4.0	3.4	1.9	1.1	2.4	16,983
Jordan	12.1	11.4	13.7	10.9	12.6	12.3	14.9	11.9	11.6	12.1	13.0	12.6	11.9	11.2	8,261
Morocco	0.9	1.4	0.6	0.7	1.9	1.8	1.6	0.8	1.0	1.0	0.6	1.1	0.7	0.7	5,197
Pakistan	1.9	3.1	1.3	1.0	3.0	6.2	2.3	1.9	1.2	3.1	2.9	1.5	1.8	0.7	6,492
Philippines	1.6	1.9	1.3	0.3	1.3	2.0	2.3	1.6	1.4	2.2	1.9	1.3	1.8	1.2	8,859
Turkey	2.9	3.7	1.6	1.4	3.3	4.4	3.0	2.9	2.0	4.5	1.9	2.5	1.6	1.3	3,736
LATIN AMERICA/ CARIBBEAN															
Brazil	2.7	3.5	1.8	1.9	2.5	5.6	3.7	2.6	2.3	4.0	3.0	2.6	1.7	1.6	3,415
Colombia	4.8	6.4	1.6	4.0	2.9	7.0	5.7	4.4	6.3	6.3	3.1	4.3	3.3	4.7	3,731
Dominican Republic	5.0	5.8	3.9	2.9	4.5	6.2	4.8	4.8	7.4	4.5	6.2	4.7	6.0	4.4	3,848
Paraguay	3.2	5.4	1.3	2.5	1.6	7.6	3.4	3.1	3.0	4.2	3.4	3.7	1.9	1.6	3,975
Peru	4.1	5.2	2.4	2.0	2.8	5.7	3.5	4.2	3.9	5.0	4.8	4.4	2.8	2.1	8,540

U = Unknown (not available)

Table 2.12 Differentials in birthweight < 2.5 kg

Percentage of recent live births for which the mother reported that the birthweight was less than 2.5 kg, by residence, level of education, maternal age and birth order/interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births <2.5 kg	Residence		Highest educational level			Maternal age at birth			Birth order/interval					Number of births	
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	5+, <24	5+, 24+			
SUB-SAHARAN AFRICA																
Burkina	12.1	12.5	11.7	12.3	12.9	9.1	18.9	11.2	8.3	21.2	12.2	9.7	11.7	8.3	1,366	
Cameroon	6.2	6.1	6.2	5.5	6.0	6.8	8.1	5.5	6.4	8.3	6.2	5.2	5.3	6.0	1,771	
Central African Republic	12.9	12.9	12.7	12.1	14.8	10.3	22.0	9.2	15.9	23.4	10.8	7.9	7.9	12.0	1,452	
Cote d'Ivoire	14.1	11.1	17.8	14.2	16.2	9.2	23.2	12.2	8.7	22.4	18.9	11.2	5.3	11.3	2,062	
Ghana	9.4	8.4	11.3	9.5	10.7	3.2	12.3	9.8	3.8	8.9	4.3	9.5	-	11.9	424	
Kenya	8.7	7.9	8.9	10.8	9.3	7.2	12.2	7.6	10.1	11.6	6.2	6.6	7.8	10.1	2,679	
Madagascar	16.6	13.1	17.5	15.6	17.0	16.2	22.3	14.7	19.3	22.8	17.6	14.9	11.3	15.0	2,498	
Malawi	10.1	U	U	7.5	11.2	14.3	14.3	10.0	5.1	12.1	12.6	9.0	10.0	9.1	1,620	
Namibia	12.8	14.6	11.3	7.8	14.0	12.6	17.2	12.0	11.8	15.0	14.2	11.0	12.4	11.9	1,706	
Niger	9.0	9.2	8.2	8.5	9.5	10.8	14.0	7.8	9.1	13.8	6.3	9.9	6.4	7.1	908	
Nigeria	7.5	6.8	8.4	13.5	6.3	5.2	1.8	8.1	8.8	4.3	6.0	8.8	2.8	11.2	782	
Rwanda	13.2	11.3	13.4	16.2	13.2	6.4	12.4	13.6	11.3	13.2	10.5	13.3	16.6	13.2	1,327	
Senegal	11.3	8.9	17.2	13.0	9.7	8.8	14.9	11.2	9.5	13.7	10.1	11.5	4.8	11.3	1,449	
Tanzania	13.7	14.9	13.0	13.2	13.7	14.6	16.5	12.5	15.6	15.2	10.2	13.7	12.7	13.3	3,994	
Uganda	11.2	9.4	12.0	16.6	10.9	8.9	13.7	10.5	9.2	13.6	9.4	11.6	9.1	9.5	1,545	
Zambia	11.4	10.5	14.3	9.5	10.5	13.0	15.8	10.2	10.1	16.0	14.4	10.7	8.5	7.4	2,705	
Zimbabwe	12.0	12.5	11.8	17.0	11.9	11.5	16.3	11.2	10.2	13.7	12.9	10.1	23.3	12.2	1,621	
ASIA/NEAR EAST/ NORTH AFRICA																
Egypt	12.1	9.6	21.5	24.6	21.2	9.1	29.3	11.2	9.4	16.0	9.4	7.5	24.5	20.0	1,186	
India	3.8	10.1	1.9	1.3	6.0	11.3	3.8	3.9	1.4	6.5	3.8	3.3	1.3	0.8	50,001	
Indonesia	7.1	6.8	7.3	9.4	7.7	6.2	10.4	6.6	6.9	8.0	7.2	6.1	10.8	7.6	8,233	
Jordan	10.3	9.2	13.2	13.2	10.8	9.4	14.2	9.7	10.9	12.0	9.8	9.7	11.9	8.8	7,084	
Kazakhstan	9.2	10.1	8.5	-	-	9.2	14.4	8.7	4.9	13.0	3.6	7.0	20.5	9.5	794	
Morocco	7.5	7.0	9.5	10.5	7.7	3.3	20.2	6.0	9.2	9.2	7.2	6.9	7.5	5.6	1,118	
Pakistan	16.0	16.3	14.4	15.6	29.1	14.1	20.7	15.4	18.2	17.0	13.9	12.0	16.5	28.1	483	
Philippines	16.7	15.4	18.7	19.4	19.9	15.3	18.3	16.2	18.4	18.0	16.3	14.9	15.0	19.4	5,356	
LATIN AMERICA/ CARIBBEAN																
Bolivia	5.7	6.2	4.6	3.3	5.4	6.1	5.7	5.6	6.2	5.4	3.8	6.5	6.4	5.7	1,874	
Brazil	9.1	8.6	11.0	13.5	10.9	7.6	9.7	8.6	11.7	9.2	5.9	8.8	16.2	12.9	4,258	
Colombia	6.6	6.8	6.0	8.6	6.6	6.5	5.7	6.6	8.1	7.4	5.5	5.8	6.8	8.2	3,459	
Dominican Republic	11.2	10.8	12.0	17.8	10.7	10.9	14.3	9.9	18.2	10.8	11.5	10.9	12.3	13.0	3,476	
Guatemala	13.1	14.5	12.1	14.5	11.1	16.5	18.1	12.0	12.1	18.9	12.2	10.9	12.2	11.1	6,749	
Haiti	21.7	20.8	24.6	24.0	31.7	14.8	33.3	20.1	18.9	22.3	23.1	19.5	10.4	29.7	263	
Paraguay	8.1	7.1	9.6	8.5	9.1	6.4	9.2	7.9	8.3	8.6	6.2	7.1	11.5	9.6	2,851	
Peru	8.4	7.3	12.2	17.5	10.8	6.7	8.2	8.1	10.4	7.0	8.4	7.7	12.8	11.8	5,271	

= Unknown (not available)

U = Unknown (not available)

Table 2.13 Differentials in very small size at birth

Percentage of recent live births for which the mother reported that the size of the child at birth was very small, by residence, level of education, maternal age and birth order/interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births of very small size	Residence		Highest educational level			Maternal age at birth			Birth order/interval				Number of births	
		Urban	Rural	None	Primary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+	5+, <24		5+, 24+
SUB-SAHARAN AFRICA															
Burkina Faso	6.5	3.5	7.0	6.8	4.1	2.9	7.2	6.2	7.0	7.6	5.9	5.4	9.8	6.6	6,366
Cameroon	2.7	2.3	3.0	2.8	2.2	3.4	2.8	2.3	4.5	3.8	2.3	2.3	3.2	2.4	3,488
Central African Republic	4.5	4.7	4.4	4.3	4.9	4.4	7.2	3.5	5.7	5.6	6.0	3.1	6.8	4.5	2,837
Cote d'Ivoire	6.3	5.2	6.8	6.5	6.3	4.5	6.0	6.2	7.3	7.4	5.2	5.9	6.5	6.1	3,989
Ghana	4.4	2.9	4.9	4.0	4.6	4.1	4.8	4.6	2.9	4.9	2.9	4.5	6.8	3.7	2,204
Kenya	2.1	2.4	2.1	1.9	2.1	2.4	3.3	1.8	2.5	3.0	1.6	1.4	1.6	2.6	6,128
Madagascar	9.8	8.8	9.9	10.5	9.8	9.2	13.7	8.6	9.9	14.2	8.6	8.0	9.1	9.2	5,683
Malawi	4.3	U	U	4.4	4.4	2.0	5.8	4.0	3.8	4.9	3.7	4.2	4.3	4.2	4,574
Namibia	7.7	6.3	8.3	7.1	8.7	6.3	10.6	7.1	7.3	9.0	8.4	7.1	6.2	7.2	3,859
Niger	14.7	9.5	15.7	14.9	14.3	6.7	16.6	14.3	14.2	16.6	14.8	13.0	16.0	15.0	7,207
Nigeria	6.4	4.4	6.9	7.4	4.8	4.4	8.6	5.7	6.8	7.7	7.3	6.3	6.2	5.3	8,205
Tanzania	2.3	3.1	2.1	3.2	1.9	0.6	3.2	1.9	3.1	2.8	2.9	1.4	4.5	2.5	8,117
Uganda	4.9	3.4	5.1	6.6	4.3	3.3	6.2	4.5	4.8	6.2	4.5	4.8	4.8	4.4	6,027
Zambia	2.2	2.7	1.8	1.9	2.0	3.1	3.0	2.2	0.9	2.9	2.6	2.4	2.5	1.4	6,279
Zimbabwe	6.0	7.6	5.4	7.7	5.0	6.7	6.4	6.3	4.0	6.8	8.1	4.9	2.8	6.8	2,364
ASIA/NEAR EAST/ NORTH AFRICA															
Egypt	3.4	2.5	4.0	3.5	4.2	2.8	3.8	3.3	4.0	3.6	4.2	2.8	3.9	3.6	11,454
India	21.2	20.1	21.5	21.8	22.8	16.9	24.6	20.0	22.1	23.5	21.1	19.9	19.4	20.8	50,001
Indonesia	1.5	1.6	1.4	2.5	1.3	1.4	2.1	1.3	1.7	1.9	1.6	1.1	0.8	1.9	16,983
Jordan	6.5	6.2	7.2	7.9	5.4	6.5	9.2	6.2	6.5	8.9	6.1	4.9	7.2	6.0	8,261
Kazakhstan	8.0	8.2	7.9	19.7	8.0	7.6	8.0	8.5	10.1	6.8	6.7	11.0	4.8	8.10	5,197
Morocco	4.2	4.6	4.0	4.3	5.6	1.8	6.6	3.8	4.6	4.8	3.5	4.0	4.7	4.2	5,197
Pakistan	6.4	6.0	6.5	6.6	6.7	4.7	7.8	6.1	6.3	7.8	6.4	5.2	6.4	6.7	6,492
Philippines	4.2	3.9	4.5	4.7	5.2	3.5	4.2	3.9	5.7	3.9	4.4	3.5	4.2	5.4	8,859
LATIN AMERICA/ CARIBBEAN															
Bolivia	9.2	8.5	10.1	12.1	9.2	8.2	8.2	9.0	10.9	8.2	10.8	7.8	13.5	9.8	3,615
Brazil	4.3	3.9	5.5	8.6	5.1	3.2	3.8	4.3	5.6	3.5	5.3	4.2	5.4	5.9	4,782
Colombia	7.6	6.1	10.3	12.2	9.2	5.8	8.4	6.9	10.9	7.3	8.6	6.5	11.7	9.9	5,050
Dominican Republic	3.5	3.5	3.4	3.2	4.0	2.7	3.7	3.2	6.1	3.1	3.3	3.4	4.5	4.5	3,848
Guatemala	12.5	9.5	14.0	16.5	10.5	8.0	13.4	11.9	14.6	13.1	12.8	10.6	13.1	13.9	9,150
Haiti	15.4	12.4	16.8	17.9	13.8	10.1	16.4	15.0	16.0	16.0	14.6	15.1	13.6	16.2	3,624
Peru	3.8	3.9	3.6	5.3	3.6	3.7	4.9	3.5	4.4	3.9	4.9	3.2	3.9	4.0	8,540

U = Unknown (not available)

3 Indicator Comparisons Between Subsequent Surveys

In 14 of the countries included in this report, at least two DHS surveys were conducted over the 10-year period from 1986 to 1996. Three of these countries, Egypt, Indonesia, and Colombia, had three surveys during this time. In this section, differences between the earliest and most recent DHS survey estimates are presented. Indicators are focused on, specifically, the percent of births in which the mother received antenatal care from a doctor, nurse, or midwife; tetanus toxoid; and delivery care from a doctor, nurse, or midwife.

3.1 CHANGE OVER TIME

Tables 3.1.1, 3.2.1, 3.3.1 and Figures 3.1, 3.2, and 3.3 present the percent change in service use at two time points, respectively, for each country for the following indicators: percent of births with antenatal care, tetanus immunization, and delivery care. The number of years between the two surveys differs by country, with a minimum of 4 years in Kenya and Peru, and a maximum of 10 years in Brazil. To standardize the varying interval lengths between surveys, the percent change in the three service use indicators for a five-year period is approximated by assuming that the observed percent change between the first survey (Time 1) and the most recent survey is evenly distributed across the interval. The approximated percent change for a five-year interval is then used to project the percent using the various services at a point five years following the first survey (Time 2).

Statistically significant differences in the percentages of births whose mothers use these three services between the first and most recent surveys were found for all but two countries (data not shown). These significant differences in service use persisted even after standardizing for length of interval between surveys (i.e., at Times 1 and 2, as described above). The two exceptions were in Uganda and Zimbabwe for the indicator on delivery care by a medically trained person, which showed virtually no change between surveys in both countries. Given the large DHS sample sizes, the significant differences shown for the majority of these countries for all three indicators are not surprising.

The criteria used to define a country as showing substantial increases in service use between Times 1 and 2 are those with approximated increases of 25 percent or more. Based on this definition, countries have been more successful at increasing levels of immunization against tetanus toxoid than at increasing use of the other two maternal health services. Four countries, Kenya, Morocco, Guatemala, and Peru show increases in use of more than 25 percent, but none have levels of change as high as those shown for tetanus toxoid (Tables 3.1.1 and 3.1.2). However, it is not surprising that antenatal care has

increased less than tetanus toxoid immunization, given the more recent development of initiatives to improve maternal health and survival, and the more extensive infrastructure required to provide antenatal care. Egypt stands out among these countries with a 19 percent decrease in the use of antenatal care between Times 1 and 2. However, this decline does not actually reflect a trend, but rather is a function of changes in survey field procedures (El-Zanaty et al., 1996).

Seven countries, Senegal, Uganda, Egypt, Bolivia, Colombia, Guatemala, and Peru, show increases in tetanus toxoid immunization of greater than 25 percent (Table 3.2.1). Three of these countries (Egypt, Guatemala, and Peru) report increases of well over 100 percent, though the initial level of tetanus toxoid immunization in these countries was less than 20 percent. The success across countries in Africa, Asia, and Latin America at increasing tetanus toxoid use is encouraging, although not entirely surprising given the low levels of immunization in DHS-I countries, the intensity of global efforts to increase immunization coverage over the past decade, and the degree to which this intervention lends itself to vertical programming.

Lastly, Peru was the only country with an increase of greater than 25 percent for delivery care, and in Kenya, delivery care actually decreased by 13 percent (Table 3.3.1). Zimbabwe showed negligible changes for all three service use indicators. It is likely that the reasons only small increases are seen in the percent of births attended by a doctor, nurse, or midwife are the same as those given above for antenatal care. But in addition to these explanations is the unpredictable nature of the timing of delivery. While the nine-month duration of pregnancy provides a number of opportunities for contact with health services, labor begins without a schedule, at all times of the day or night, increasing the difficulty of accessing services and increasing the importance of service availability.

Several caveats are warranted in considering these results. Specifically, this analysis assumes that changes are continuous in magnitude over time. This is clearly not the case, for example, where intense, focused interventions cause a steep rise in service utilization. These percentages represent all births in the past five years for all countries except Ghana III (3 years), Uganda III (4 years), Zimbabwe III (3 years), and Bolivia III (3 years). The shorter time span in the more recent survey for these countries might be expected to increase the differences observed since the estimate is based on a shorter period more easily influenced by recent improvements. However, of these countries, only Uganda and Bolivia had standardized five-year percent differences above 25 percent and this was only for the tetanus toxoid indicator.

Table 3.1.1 Percent change in ANC service from first to most recent survey

Percentage of births for which women received ANC for countries with subsequent surveys, the period (years) between surveys, and the approximated 5-year percent difference in ANC from the first to most recent survey, Demographic and Health Surveys, 1986-1996

Survey	Percent of births for which TT received	Period between surveys (years)	Adjusted 5-year percent difference	Number of births
Ghana I	82.4	5.0	3.9	4,136
Ghana II	85.6			2,204
Kenya I	77.3	4.0	28.3	7,127
Kenya III	94.8			6,128
Senegal I	62.4	7.0	12.8	4,287
Senegal II	73.6			5,645
Uganda I	86.8	6.0	4.2	5,049
Uganda III	91.2			6,027
Zimbabwe I	91.2	6.0	1.7	3,358
Zimbabwe III	93.1			2,364
Egypt I	52.8	7.0	-18.5	8,732
Egypt III	39.1			11,454
Morocco I	24.7	5.0	30.4	6,102
Morocco III	32.2			5,197
Bolivia I	44.9	5.0	16.9	5,779
Bolivia III	52.5			3,615
Colombia I	72.5	9.0	7.7	2,703
Colombia III	82.5			5,050
Dominican Republic I	94.9	5.0	2.0	4,443
Dominican Republic II	96.8			3,848
Guatemala I	34.1	8.0	33.7	4,627
Guatemala III	52.5			9,150
Peru I	54.8	4.0	25.8	3,131
Peru II	66.1			8,540

3.2 DIFFERENCES BY BACKGROUND CHARACTERISTICS

Examining differentials in the service use indicators for two points in time permits identification of the population subgroups most associated with the change shown at the national level. Increases in service use are most suggestive of significant improvements in service access and availability if the increases are concentrated in population subgroups not routinely served. For instance, substantial increases over time in the use of antenatal care among rural women, compared to negligible change in use by urban women, are suggestive of a successful policy aimed at expanding access to underserved areas.

Tables 3.1.2-3 to 3.3.2-3 present the percent of births for which the mother received antenatal care, tetanus toxoid immunization and delivery care, respectively, in the first and most recent survey by various background characteristics of the

woman, as well as the approximated percent change between Times 1 and 2, as described above. The background characteristics included are maternal age at birth, maternal education, residence, birth order, and partner's education. For antenatal care, in the majority of categories, Kenya, Morocco, Guatemala, and Peru show increases of greater than 25 percent (Tables 3.1.2 and 3.1.3). In contrast, with the exception of Egypt (discussed above), the greatest decrease in antenatal care was five percent among births to women in Bolivia whose partners had secondary or higher level education. Within background characteristics, the categories where increases greater than 25 percent are consistently noted in these countries are, in general, those traditionally associated with higher risk and lower service use—for example, births to women with no education, with rural residence, and whose partners have no education.

For tetanus toxoid, in almost all categories, Senegal, Uganda, Egypt, Bolivia, Colombia, Guatemala, and Peru show increases greater than 25 percent (Tables 3.2.2 and 3.2.3). There were very few categories within background characteristics that did not show this level of increase for these countries. The greatest decrease in tetanus toxoid immunization was in the Dominican Republic among births to women 35 years or older (5 percent).

The data on delivery care by background characteristics show very similar patterns as described for antenatal care (Tables 3.3.2 and 3.3.3). In almost all categories, delivery care in Peru increased by more than 25 percent. As for antenatal care, the categories within background characteristics consistently showing differences greater than 25 percent in Peru are those traditionally associated with higher risk and lower service use (i.e., no education, rural residence). In contrast to antenatal care and tetanus toxoid immunization, several countries had decreases in the percent receiving delivery care. However, all countries had decreases less than 25 percent with the exception of Kenya, which had decreases in all categories except for births to urban women. The categories within background characteristics showing the greatest decreases in Kenya were births to: women with no education (41 percent); women 35 years or older (30 percent); and women whose partners had no education (29 percent).

These tables indicate that in countries where the approximated percent increase is of 25 percent or more in one of the three service use indicators, the increases were slightly more concentrated among the higher risk subgroups. It is unfortunate that so few countries exhibited substantial increases for antenatal and delivery care. However, the data suggest that in settings such as Peru, where coverage increased, service access improved among women who are typically underserved.

Figure 3.1 Adjusted five-year percentages of births with antenatal care (ANC) in the earliest and most recent DHS surveys

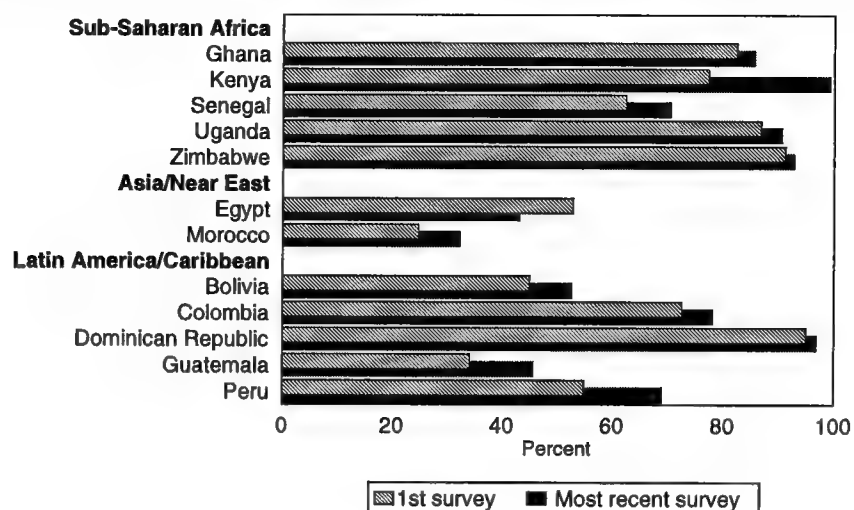


Figure 3.2 Adjusted five-year percentages of births with tetanus toxoid (TT) in the earliest and most recent DHS surveys

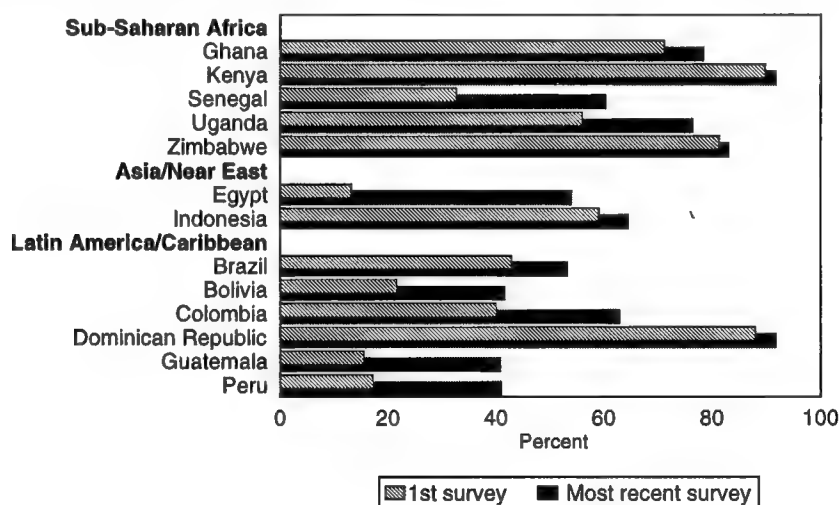


Figure 3.3 Adjusted five-year percentages of births with delivery care (DC) in the earliest and most recent DHS surveys

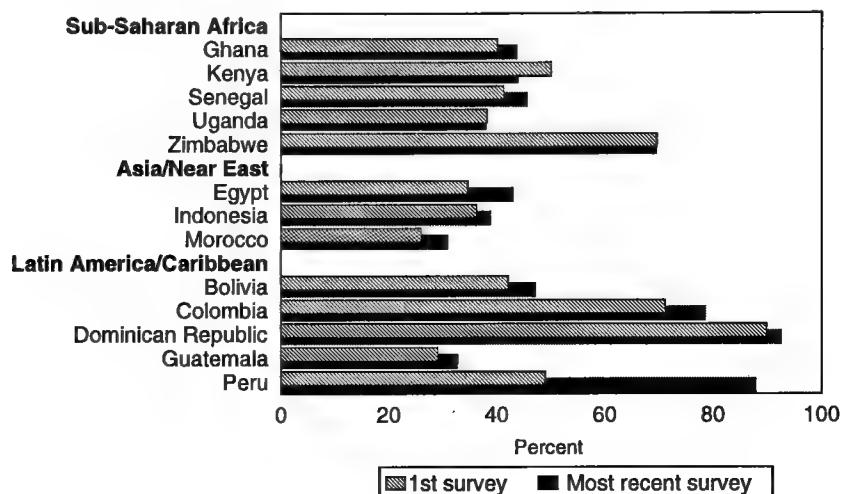


Table 3.1.2 Percent change in ANC by maternal age, education, and residence

Percentage of births for which women received ANC as reported in the first and most recent survey in countries with subsequent surveys, by maternal age, education, and residence, with approximate 5-year percent differences between surveys, Demographic and Health Surveys, 1986-1996

Survey	Maternal age at birth						Maternal education						Residence					
	<20		20-34		35+		None		Primary		Sec.+		Urban		Rural			
	%	change	%	change	%	change	%	change	%	change	%	change	%	change	%	change	%	change
Ghana I	85.1	2.7	83.0	4.0	77.3	4.1	72.5	3.4	89.7	2.5	97.1	2.2	93.7	2.8	78.1	4.2		
Ghana II	87.4		86.3		80.5		75.0		91.9		99.2		96.3		81.4			
Kenya I	77.0	26.6	78.7	26.4	70.7	40.8	72.4	26.6	77.8	28.9	83.1	22.7	81.4	24.4	76.6	29.0		
Kenya III	93.4		95.3		93.8		87.8		95.8		98.2		97.3		94.4			
Senegal I	59.5	13.3	64.1	12.1	57.1	16.9	56.3	15.9	89.7	3.2	97.7	0.2	94.5	-0.3	45.4	28.0		
Senegal II	70.6		75.0		70.6		68.8		93.7		98.0		94.1		63.2			
Uganda I	91.0	1.4	85.7	5.4	85.9	1.9	81.3	4.6	89.9	2.6	95.3	2.9	95.3	-0.3	85.9	4.7		
Uganda III	92.5		91.3		87.9		85.8		92.7		98.6		95.0		90.7			
Zimbabwe I	91.1	4.0	92.2	0.9	86.5	2.4	86.0	5.6	90.9	0.0	97.2	-0.7	96.1	-0.6	89.4	2.7		
Zimbabwe III	95.5		93.2		89.0		91.8		90.9		96.4		95.4		92.3			
Egypt I	45.7	-20.0	53.8	-17.5	53.4	-23.1	41.7	-33.7	57.0	-27.3	80.5	-13.2	68.9	-11.0	41.7	-24.8		
Egypt III	32.9		40.6		36.1		22.0		35.2		65.6		58.3		27.2			
Morocco I	17.6	64.2	26.0	30.0	22.9	22.3	18.3	26.8	53.4	12.5	73.5	18.9	48.3	25.3	12.6	38.9		
Morocco III	28.9		33.8		28.0		23.2		60.1		87.4		60.5		17.5			
Bolivia I	48.0	6.0	46.5	18.5	35.4	19.8	15.4	41.6	37.8	12.2	80.4	-3.7	62.3	8.7	28.6	24.8		
Bolivia III	50.9		55.1		42.4		21.8		42.4		77.4		67.7		35.7			
Colombia I	75.1	3.0	72.9	8.5	65.6	10.0	44.7	2.9	65.8	6.9	91.1	1.5	82.0	5.2	57.4	12.0		
Colombia III	79.2		84.1		77.4		47.0		74.0		93.6		89.7		69.8			
Dominican Republic I	94.8	1.1	95.4	1.9	90.9	5.3	83.7	1.9	94.3	3.0	99.2	-0.2	95.9	1.8	93.4	2.4		
Dominican Republic II	95.8		97.2		95.7		85.3		97.1		99.0		97.6		95.6			
Guatemala I	34.2	26.7	35.3	34.2	26.6	48.2	18.5	56.4	44.3	16.8	86.0	4.1	57.1	15.0	25.6	44.2		
Guatemala III	48.8		54.6		47.1		35.2		56.2		91.6		70.8		43.7			
Peru I	51.8	25.8	57.6	22.6	45.8	39.0	19.4	103.7	46.2	11.9	83.9	3.6	79.1	4.4	28.4	59.0		
Peru II	62.5		68.0		60.1		35.5		50.6		86.3		81.9		41.8			

Table 3.1.3 Percent change in ANC by birth order and partner's education

Percentage of births for which women received ANC as reported in the first and most recent survey in countries with subsequent surveys, by birth order, and partner's education, with approximated 5 year percent differences between surveys, Demographic and Health Surveys, 1986-1996

	Birth order					Partner's education								
	1st	% change	2-3	% change	4-5+	% change	Not in union	% change	None	% change	Primary	% change	Sec.+	% change
Survey														
Ghana I	86.3	3.7	84.2	3.0	81.1	6.4	79.4	6.5	68.5	7.4	87.5	3.3	93.6	2.9
Ghana II	89.5		86.7		86.3		84.6		73.6		90.4		96.3	
Kenya I	77.6	27.5	78.7	27.2	80.1	24.2	80.8	17.3	67.8	32.8	77.3	29.1	79.9	28.6
Kenya III	94.7		95.8		95.6		92.0		85.6		95.3		98.2	
Senegal I	65.7	13.9	63.9	13.6	61.7	13.0	85.8	-0.5	52.9	19.8	88.3	-3.6	95.6	1.6
Senegal II	78.5		76.1		72.9		85.2		67.6		83.8		97.7	
Uganda I	89.4	3.3	87.3	4.9	85.1	6.5	86.0	3.0	81.8	5.4	86.1	4.0	93.4	3.1
Uganda III	92.9		92.4		91.7		89.1		87.1		90.2		96.9	
Zimbabwe I	92.5	2.8	92.9	0.6	91.6	1.4	93.3	-0.8	83.7	6.6	91.5	-0.4	94.8	0.9
Zimbabwe III	95.6		93.6		93.1		92.4		90.3		91.1		95.8	
Egypt I	65.8	-13.2	52.7	-13.6	48.5	-27.0	36.5	-29.2	41.6	-35.0	51.5	-25.8	72.6	-16.6
Egypt III	53.6		42.7		30.2		21.6		21.2		32.9		55.7	
Morocco I	30.9	46.3	27.9	31.9	23.0	30.4	23.2	72.4	15.9	22.6	29.9	40.5	61.3	16.3
Morocco III	45.2		36.8		30.0		40.0		19.5		42.0		71.3	
Bolivia I	58.8	5.8	49.6	18.5	40.8	17.9	48.7	14.8	16.0	30.6	30.2	18.5	68.7	-5.1
Bolivia III	62.2		58.8		48.1		55.9		20.9		35.8		65.2	
Colombia I	82.8	5.2	77.5	5.1	60.5	12.7	68.3	9.4	53.4	-0.2	68.1	7.8	88.9	2.7
Colombia III	90.5		84.6		74.3		79.8		53.2		77.7		93.2	
Dominican Republic I	97.3	1.3	95.6	1.0	91.1	5.2	94.8	1.9	89.4	3.8	94.9	1.6	98.2	0.8
Dominican Republic II	98.6		96.6		95.8		96.6		92.8		96.4		99.0	
Guatemala I	45.3	22.8	37.7	33.2	29.5	38.8	47.1	14.2	17.6	67.5	35.9	23.9	76.7	9.3
Guatemala III	61.8		57.7		47.8		57.8		36.6		49.6		88.1	
Peru I	67.5	21.1	62.0	15.9	52.2	21.1	50.9	41.3	13.3	184.2	35.4	38.1	80.7	-0.9
Peru II	78.9		69.9		61.0		67.7		32.9		46.2		80.1	

Table 3.2.1 Percent change in tetanus toxoid immunization

Percentage of births for which women received TT for countries with subsequent surveys, the period (years) between surveys, and the approximated 5-year percent difference in TT from the first to most recent survey. Demographic and Health Surveys, 1986-1996

Survey	Percent of births for which TT received	Period between surveys (years)	Adjusted 5-year percent difference	Number of births
Ghana I	71.1	5.0	10.3	4,136
Ghana II	78.4			2,204
Kenya I	89.8	4.0	2.1	7,127
Kenya III	91.3			6,128
Senegal I	32.7	7.0	84.5	4,287
Senegal II	71.4			5,645
Uganda I	56.0	6.0	36.5	5,049
Uganda III	80.5			6,027
Zimbabwe I	81.3	6.0	2.1	3,358
Zimbabwe III	83.3			2,364
Egypt I	13.2	7.0	309.0	8,732
Egypt III	70.3			11,454
Indonesia I	59.1	7.0	9.1	8,243
Indonesia III	66.6			16,983
Bolivia I	21.6	5.0	92.6	5,779
Bolivia III	41.6			3,615
Brazil I	42.9	10.0	24.0	3,481
Brazil III	63.5			4,782
Colombia I	40.1	9.0	56.8	2,703
Colombia III	81.1			5,050
Dominican Republic I	88.0	5.0	4.2	4,443
Dominican Republic II	91.7			3,848
Guatemala I	15.5	8.0	163.3	4,627
Guatemala III	56.0			9,150
Peru I	17.2	4.0	138.1	3,131
Peru II	36.2			8,540

Table 3.2.2. Percent change in tetanus toxoid immunization by maternal age, education, and residence

Percentage of births for which women received TT as reported in the first and most recent survey in countries with subsequent surveys, by maternal age, education, and residence, with approximated 5-year percent differences between surveys, Demographic and Health Surveys, 1986-1996

Survey	Maternal age at birth				Maternal education				Residence							
	<20	% change	20-34	% change	35+	% change	None	% change	Primary	% change	Sec.+	% change	Urban	% change	Rural	% change
Ghana I	68.9	10.2	72.4	11.5	67.1	4.0	61.3	11.6	78.3	7.2	85.9	10.7	82.4	10.7	66.9	9.7
Ghana II	75.9		80.7		69.8		68.4		83.9		95.1		91.2		73.4	
Kenya I	89.3	1.0	90.5	2.1	86.7	3.5	86.0	0.4	90.3	1.5	93.8	2.0	92.9	3.1	89.3	2.0
Kenya III	90.0		92.0		89.1		86.3		91.4		95.3		95.2		90.7	
Senegal I	28.3	97.2	34.4	80.1	29.5	97.1	28.7	96.1	48.3	59.7	62.1	33.6	54.7	44.3	21.0	141.8
Senegal II	66.8		73.0		69.6		67.3		88.7		91.3		88.6		62.7	
Uganda I	54.6	43.3	56.5	35.8	55.7	27.2	50.0	40.0	58.0	35.5	74.1	15.2	75.9	10.4	53.9	40.2
Uganda III	83.0		80.8		73.9		74.0		82.7		87.6		85.4		79.9	
Zimbabwe I	82.5	6.3	82.0	1.7	76.8	-2.9	77.5	2.4	82.0	-0.2	82.9	3.8	83.2	2.6	80.6	2.0
Zimbabwe III	88.7		83.7		74.1		79.7		81.8		86.7		85.8		82.5	
Egypt I	12.6	358.8	13.4	308.6	13.1	238.3	11.2	352.0	15.1	267.7	16.3	255.9	14.1	271.0	12.6	336.2
Egypt III	75.9		71.3		56.8		66.4		71.7		74.7		67.6		71.9	
Indonesia I	58.3	11.8	60.5	8.9	50.1	8.6	35.1	12.8	58.3	8.5	77.7	2.3	72.0	7.0	53.9	10.5
Indonesia III	67.9		68.0		56.1		41.4		65.2		80.2		79.1		61.8	
Bolivia I	22.9	78.6	21.7	99.1	20.1	73.6	11.5	82.6	20.6	76.2	31.2	80.8	27.0	95.6	16.6	75.9
Bolivia III	40.9		43.2		34.9		21.0		36.3		56.4		52.8		29.2	
Brazil I	42.0	32.4	42.4	23.0	46.9	17.5	35.6	29.1	43.5	21.4	45.7	21.7	45.3	21.1	38.0	29.7
Brazil III	69.2		61.9		63.3		56.3		62.1		65.5		64.4		60.6	
Colombia I	41.4	53.9	41.1	54.9	30.9	81.1	41.7	39.0	38.0	64.9	43.4	48.0	39.5	57.5	41.1	55.6
Colombia III	81.6		81.7		76.0		71.0		82.4		80.9		80.4		82.2	
Dominican Republic I	87.8	1.9	88.5	5.5	84.0	-5.2	77.8	2.3	87.4	3.5	92.4	4.1	89.4	4.5	86.2	3.7
Dominican Republic II	89.5		93.4		79.6		79.6		90.5		96.2		93.4		89.4	
Guatemala I	16.0	157.4	15.7	161.2	13.5	188.4	11.5	220.1	20.3	123.2	14.9	153.9	18.7	120.7	14.3	184.4
Guatemala III	56.3		56.2		54.2		52.0		60.3		51.6		54.8		56.5	
Peru I	20.1	116.9	17.8	133.4	12.2	194.7	10.5	133.3	15.0	139.2	23.4	106.8	23.6	100.1	10.2	202.2
Peru II	38.9		36.8		31.2		21.7		31.7		43.4		42.5		26.7	

Table 3.2.3 Percent change in tetanus toxoid immunization by birth order and partner's education

Percentage of births for which women received TT as reported in the first and most recent survey in countries with subsequent surveys, by birth order, and partner's education, with approximated 5-year percent differences between surveys, Demographic and Health Surveys, 1986-1996

Survey	Birth order					Partner's education								
	1st	% change	2-3	% change	4-5+	% change	Not in Union	% change	None	% change	Primary	% change	Sec.+	% change
Ghana I	72.9	12.3	71.8	11.4	72.5	7.9	70.1	11.6	57.3	14.7	75.0	10.5	83.9	8.2
Ghana II	81.9		80.0		78.2		78.2		65.7		82.9		90.8	
Kenya I	90.2	2.5	89.9	3.3	90.9	1.0	88.8	0.1	76.9	9.6	91.5	-0.5	92.9	3.6
Kenya III	92.0		92.3		91.6		88.9		82.8		91.1		95.6	
Senegal I	32.7	89.3	34.2	81.5	34.5	77.2	39.7	74.3	27.9	97.0	45.3	61.8	54.6	50.1
Senegal II	73.6		73.2		71.8		81.0		65.8		84.5		92.9	
Uganda I	56.1	43.4	57.8	36.5	57.3	31.3	53.7	36.5	49.9	47.9	53.8	38.9	69.1	22.3
Uganda III	85.3		83.1		78.8		77.2		78.6		78.9		87.6	
Zimbabwe I	84.8	3.1	81.9	4.5	82.3	-1.3	80.5	4.2	76.0	3.8	82.7	-1.6	83.3	2.3
Zimbabwe III	88.0		86.3		81.0		84.6		79.5		81.1		85.6	
Egypt I	15.7	283.0	12.9	335.5	12.7	300.9	10.4	346.2	10.4	363.3	13.5	306.3	16.9	243.0
Egypt III	77.9		73.5		66.2		60.8		63.3		71.4		74.4	
Indonesia I	67.2	7.2	60.8	10.5	54.4	9.6	42.1	32.6	33.8	21.8	56.9	7.8	73.4	4.3
Indonesia III	74.0		69.7		61.7		61.3		44.1		63.1		77.8	
Bolivia I	22.8	82.9	22.0	100.9	21.2	100.9	20.8	103.4	13.6	113.2	18.6	73.7	27.7	75.1
Bolivia III	41.7		44.2		42.6		42.3		29.0		32.3		48.5	
Brazil I	46.0	29.9	41.6	20.6	38.3	24.8	42.4	31.0	40.5	25.3	43.7	23.9	43.0	21.5
Brazil III	73.5		58.7		57.3		68.7		61.0		64.6		61.5	
Colombia I	43.5	48.7	41.4	54.9	35.5	67.6	35.5	63.7	44.1	43.1	40.2	59.8	40.3	57.3
Colombia III	81.6		82.3		78.7		76.2		78.3		83.5		81.9	
Dominican Republic I	90.1	4.9	90.0	1.9	83.8	8.2	86.9	5.8	79.2	6.7	88.3	3.4	91.9	2.6
Dominican Republic II	94.5		91.7		90.7		91.9		84.5		91.3		94.3	
Guatemala I	16.2	146.2	16.4	153.6	14.9	180.8	19.7	98.0	12.4	193.0	17.8	148.9	17.8	121.5
Guatemala III	54.1		56.7		58.0		50.6		50.7		60.2		52.4	
Peru I	20.0	131.3	20.0	106.3	15.4	162.3	14.8	175.7	8.4	208.3	13.0	156.7	22.8	103.1
Peru II	41.0		37.0		35.4		35.6		22.4		29.3		41.6	

Table 3.3.1 Percent change in delivery care

Percentage of births for which women received DC for countries with subsequent surveys, the period (years) between surveys, and the approximated 5-year percent difference in DC from the first to most recent survey, Demographic and Health Surveys, 1986-1996

Survey	Percent of births for which DC received	Period between surveys (years)	Adjusted 5-year percent difference	Number of births
Ghana I	40.1	5.0	9.0	4,136
Ghana II	43.7			2,204
Kenya I	50.1	4.0	-12.5	7,127
Kenya III	45.1			6,128
Senegal I	41.3	7.0	10.2	4,287
Senegal II	47.2			5,645
Uganda I	38.1	6.0	-0.7	5,049
Uganda III	37.8			6,027
Zimbabwe I	69.6	6.0	-0.2	3,358
Zimbabwe III	69.4			2,364
Egypt I	34.6	7.0	23.9	8,732
Egypt III	46.2			11,454
Indonesia I	36.3	7.0	6.9	8,243
Indonesia III	39.8			16,983
Morocco I	26.0	5.0	18.5	6,102
Morocco III	30.8			5,197
Bolivia I	42.1	5.0	11.9	5,779
Bolivia III	47.1			3,615
Colombia I	71.1	9.0	10.5	2,703
Colombia III	84.5			5,050
Dominican Republic I	89.8	5.0	3.0	4,443
Dominican Republic II	92.5			3,848
Guatemala I	29.1	8.0	12.2	4,627
Guatemala III	34.8			9,150
Peru I	49.0	4.0	79.1	3,131
Peru II	80.0			8,540

Table 3.3.2 Percent change in delivery care by maternal age, education, and residence

Percentage of births for which women received DC as reported in the first and most recent survey in countries with subsequent surveys, by maternal age, education, and residence, with approximated 5-year percent differences between surveys, Demographic and Health Surveys, 1986-1996

Survey	Maternal age at birth				Maternal education				Residence							
	<20	% change	20-34	% change	35+	% change	None	% change	Primary	% change	Sec.+	% change	Urban	% change	Rural	% change
Ghana I	45.0	5.8	39.8	13.1	37.3	-6.4	25.8	-7.4	49.0	10.4	79.0	6.8	70.1	15.3	28.9	1.7
Ghana II	47.6		45.0		34.9		23.9		54.1		84.4		80.8		29.4	
Kenya I	57.1	-13.6	50.6	-10.1	39.9	-30.1	33.5	-41.4	49.0	-17.1	78.0	-7.9	77.4	3.7	45.7	-15.3
Kenya III	50.9		46.5		30.3		22.4		42.3		73.1		79.7		40.1	
Senegal I	38.7	11.3	43.2	8.1	34.8	22.8	34.1	11.3	70.6	6.4	91.6	0.9	82.2	1.7	19.7	31.9
Senegal II	44.8		48.1		45.9		39.5		76.9		92.7		84.1		28.5	
Uganda I	46.0	-3.4	36.7	0.2	32.8	-5.6	23.1	-9.0	43.9	-6.6	77.8	-4.9	79.7	-0.9	33.7	-3.5
Uganda III	44.1		36.8		30.6		20.6		40.4		73.2		78.8		32.3	
Zimbabwe I	70.1	1.5	71.5	-0.6	59.3	-2.1	46.2	-7.6	69.9	-8.6	91.1	-3.3	90.4	0.6	62.0	-0.4
Zimbabwe III	71.4		71.0		57.8		42.0		62.7		87.5		91.1		61.7	
Egypt I	28.3	30.8	35.1	24.0	37.1	21.4	20.0	28.2	37.5	12.2	76.0	-2.4	57.1	13.5	19.0	51.9
Egypt III	40.5		46.9		48.2		27.9		43.9		73.4		67.9		32.8	
Indonesia I	26.7	1.9	38.9	7.7	31.4	6.4	11.7	-2.4	31.8	-6.1	77.1	-1.7	69.0	7.7	24.2	5.3
Indonesia III	27.4		43.1		34.2		11.3		29.1		75.3		76.4		26.0	
Morocco I	28.6	25.5	27.0	20.0	20.7	10.1	18.4	12.0	59.3	8.6	84.4	8.2	56.2	13.2	10.5	31.4
Morocco III	35.9		32.4		22.8		20.6		64.4		91.3		63.6		13.8	
Bolivia I	46.1	14.5	43.5	12.0	32.5	8.3	11.0	11.8	33.9	3.2	80.9	-5.9	62.6	5.4	23.0	13.9
Bolivia III	52.8		48.7		35.2		12.3		35.0		76.1		66.0		26.2	
Colombia I	72.0	11.9	72.3	9.8	60.1	15.2	48.5	8.1	63.3	10.4	90.2	3.4	84.3	5.6	50.1	21.7
Colombia III	87.4		85.0		76.5		55.6		75.1		95.7		92.8		69.7	
Dominican Republic I	91.5	3.1	90.2	2.9	81.2	3.1	73.5	-2.0	88.4	3.4	97.8	0.8	95.0	3.1	82.9	2.1
Dominican Republic II	94.3		92.8		83.7		72.0		91.4		98.6		97.9		84.6	
Guatemala I	30.9	8.9	30.4	11.9	19.3	24.6	12.8	10.7	39.2	-4.6	87.3	1.8	59.5	4.1	17.9	11.2
Guatemala III	35.3		36.2		26.9		15.0		36.3		89.8		63.4		21.1	
Peru I	49.3	75.1	51.9	69.6	37.3	132.7	11.6	474.1	35.9	121.5	85.1	12.3	80.0	17.3	15.5	382.3
Peru II	78.9		80.8		76.9		55.6		70.8		93.5		91.1		62.9	

Table 3.3.3 Percent change in delivery care by birth order and partner's education

Percentage of births for which women received DC as reported in the first and most recent survey in countries with subsequent surveys, by birth order, and partner's education, with approximated 5-year percent differences between surveys, Demographic and Health Surveys, 1986-1996

	Birth order					Partner's education								
	1st	% change	2-3	% change	4-5+	% change	Not in union	% change	None	% change	Primary	% change	Sec.+	% change
Survey	48.8	15.2	40.4	10.6	37.4	10.7	44.7	-1.3	19.8	3.0	42.6	13.4	67.0	8.4
Ghana I	56.2		44.7		41.4		44.1		20.4		48.3		72.6	
Ghana II	65.0	-6.5	55.2	-14.3	47.8	-14.1	54.9	-17.8	31.4	-28.7	43.1	-18.0	67.2	-7.8
Kenya I	61.6		48.9		42.4		47.1		24.2		36.9		63.0	
Kenya III	47.3	16.0	43.9	8.0	39.4	9.6	73.4	-1.7	29.4	18.0	69.3	-2.9	82.3	5.5
Senegal I	57.9		48.8		44.7		71.7		36.8		66.5		88.6	
Senegal II	48.7	1.2	39.2	-1.7	34.9	-3.3	43.4	0.2	23.0	-20.7	32.8	-5.1	62.3	-2.5
Uganda I	49.4		38.4		33.5		43.5		17.3		30.8		60.4	
Uganda III	77.6	1.6	73.9	-2.3	68.8	-1.2	70.3	0.9	46.7	0.4	68.1	-9.1	86.1	-4.3
Zimbabwe I	79.1		71.9		67.8		71.1		46.9		60.7		81.7	
Zimbabwe III	50.8	18.6	37.1	21.6	27.6	24.6	26.9	50.5	18.9	27.6	31.3	21.7	63.5	-0.4
Egypt I	64.0		48.3		37.1		45.9		26.2		40.8		63.1	
Egypt III	42.4	8.1	36.5	11.0	31.9	3.6	25.1	13.9	8.2	31.4	26.7	-1.1	68.3	0.5
Indonesia I	47.2		42.1		33.5		30.0		11.8		26.3		68.8	
Indonesia III	44.0	19.8	28.6	22.4	22.5	16.9	37.3	36.2	15.3	13.7	33.1	16.3	67.7	9.5
Morocco I	52.7		35.0		26.3		50.8		17.4		38.5		74.1	
Morocco III	57.0	12.3	47.0	16.4	37.1	-0.8	46.8	28.6	9.0	25.6	26.5	-4.2	66.0	-6.5
Bolivia I	64.0		54.7		36.8		60.2		11.3		25.4		61.7	
Bolivia III	83.8	6.6	75.0	8.3	59.1	13.2	72.2	10.7	43.3	25.7	64.0	11.2	90.7	2.2
Colombia I	93.7		73.1		86.1		63.3		76.9		94.3			
Colombia III	86.2	2.7	92.1	2.1	85.7	2.6	92.0	4.2	76.8	-3.5	88.8	2.3	97.9	0.5
Dominican Republic I	94.7		94.0		87.9		95.9		74.1		90.8		98.4	
Dominican Republic II	97.3		94.0		87.9		95.9		74.1		90.8		98.4	
Guatemala I	44.8	9.6	33.6	14.9	22.9	9.6	47.7	4.8	9.9	20.8	30.9	-4.0	81.0	2.5
Guatemala III	51.7		26.4		51.4		13.2		28.9		84.2			
Peru I	41.6	42.2	58.3	52.1	43.2	96.6	51.7	76.6	13.3	397.6	25.5	208.3	77.7	17.1
Peru II	66.4		82.6		76.6		83.4		55.6		68.0		88.3	
	88.8													

4 Perceived Problems During Childbirth

In 1987, the Safe Motherhood Conference in Nairobi focused attention on the large number of avoidable maternal deaths occurring each year in developing countries. The decade following this conference has seen an increase in program efforts to reduce the burden of maternal morbidity and mortality. Subsequently, the need for appropriate and feasible indicators of program impact has emerged and the dearth of data on maternal health status has become more evident. Consequently, the demand for data on levels and determinants of maternal morbidity, mortality, and health service coverage has increased.

Unfortunately, a number of measurement issues have hindered the progress of indicator development and implementation in the field of maternal health. The rarity of maternal deaths; the fact that most maternal events occur in the home (unobserved by medical personnel) at unanticipated times; the fact that maternal complications are often unpredictable and unpreventable; the low status of women; sociocultural barriers; and the lack of lay recognition of maternal problems are all factors that have worked together to create a vexing set of measurement challenges.

One data collection issue that has been of particular programmatic interest is that of self-reported data on maternal complications (Stewart et al., 1996). In a pilot study in the Philippines, an instrument aimed at collecting this type of information was validated, tested, and fielded, and was felt to be useful in that setting (NSO and MI, 1994). Subsequently, a series of five additional validation studies were conducted in a variety of cultural and geographic settings. In September 1996, a meeting was held to discuss the findings of these additional studies. In summary, this combined body of research indicates that women's self-reported data from large-scale surveys should not be used to arrive at population estimates of biomedically defined, life-threatening obstetric complications. At the same time, data on women's perceptions of birth-related problems may provide a useful indication of what women do when they think they have a problem.

In the third phase of the DHS program, data were collected in some countries from women with recent births about whether they experienced signs or symptoms of complications around delivery for those recent births. In a few countries surveyed in the second phase of DHS, similar questions were also asked. Table 4.1 lists the countries for which these data were collected and presents the wording of questions asked. In this section, these data are presented and discussed.

Table 4.2 presents the overall percentage of births for which complications were reported. As alluded to above, there

is no way to determine how closely these reports of complications correlate with what would medically be labeled as potentially life-threatening conditions. However, most experts would probably agree that a prevalence of convulsions above 2 or 3 percent is highly unlikely. Seven of the 11 countries where this question was asked had levels above 3 percent with convulsions. Bleeding, on the other hand, is probably under reported in the Asian/Near East and North African countries represented. For example, in Egypt and India fewer than 4 percent reported this symptom. There is a good deal of variation in percentages across countries, with countries in which respondents were prompted (by reading a description of the complication) generally reporting higher levels than those countries in which respondents were asked open-ended questions about the problems experienced (Namibia, India, Dominican Republic).

Table 4.3 presents the percent distribution of births with complications according to whether the woman had antenatal and delivery care, only antenatal care, only delivery care, or neither. This table is particularly interesting with Table 2.9, which gives the distribution of care received among all births. The question of interest in making this comparison is whether or not women reporting complications were more likely to receive care than those not reporting problems. In all countries other than Bolivia and Guatemala, there is a general pattern of births reported as complicated having higher use of antenatal care and delivery care combined and less likelihood of receiving neither type of care. These findings are somewhat difficult to interpret because it may be that women who use services are selectively different in their reporting than those that do not. But in any case, the overall pattern suggests that women who perceive and report a problem are slightly more likely to seek medical care.

Table 4.4 presents differentials for women reporting a perceived problem around the time of delivery. While many indicators, such as service utilization, fertility, and mortality show consistent patterns by differentials, it is more difficult to analyze what the pattern of complications by differentials is expected to be. This is largely due to the fact that birth-related complications can and do occur among all women, regardless of socioeconomic status or risk status during the antenatal period. At the same time, some problems, if identified and managed appropriately from the start, may not develop into their most severe form, and therefore, may not manifest the symptoms women were asked about in these questions. However, data on the quality of the care received by women who reported using delivery services are not available in the DHS so this aspect cannot be analyzed. For these reasons, it is not entirely surprising that there are no clear patterns seen in this table across countries or global regions.

Table 4.1 Birth-related complications questions that were asked

Wording of the questions on birth-related complications and the countries in which these questions were asked

Standard Questions:	Countries
<p>In the DHS core questionnaire, the following questions were asked after the question on who assisted the delivery: Around the time of the birth of (NAME), did you have any of the following problems?</p> <ul style="list-style-type: none"> • Long labor, that is, did your regular contractions last more than 12 hours? • Excessive bleeding that was so much that you feared it was life threatening? • A high fever with bad smelling vaginal discharge? • Convulsions not caused by fever? 	<p>Central African Republic Uganda Zimbabwe</p> <p>Egypt Indonesia</p> <p>Bolivia Brazil Colombia Guatemala</p>
Non-Standard Questions	Countries
<ul style="list-style-type: none"> • Did you experience any complications during the labor and/or delivery of (NAME)? • If yes, what kind of problem(s) did you have? <p>PRECODED RESPONSES INCLUDED (Circle all that apply):</p> <ul style="list-style-type: none"> • Labor more than 24 hours • Excessive bleeding • Convulsions • Malpresentation • Multiple pregnancy • High fever • Other: _____ 	<p>Namibia</p>
<p>Standard core questions with the following revisions:</p> <ul style="list-style-type: none"> • Long labor, that is, did your regular contractions last more than 18 hours? • Early rupture of amniotic fluid sac? 	<p>Kazakstan</p>
<ul style="list-style-type: none"> • How long were you in labor? (Response coded in number of hours) 	<p>Pakistan</p>
<ul style="list-style-type: none"> • Did you have any problem or complication related to your pregnancy with (NAME)? • YES, what problems did you have?: _____ 	<p>Dominican Republic</p>
<p>Were there any complications in the delivery of (NAME)? IF YES, what were the complications? RECORD ALL MENTIONED</p> <ul style="list-style-type: none"> • Caesarean section • Use of forceps • Excessive bleeding • Long period of labor • Delayed delivery of placenta • Other: _____ 	<p>India</p>

Table 4.2 Birth-related complications reported

Percentage of recent live births for which the woman reported symptoms of a birth-related complication, Demographic and Health Surveys, 1990-1996

Country	Percent of births for which a complication was reported	Long labor ¹	Excessive bleeding	High fever ²	Convulsions	Number of births
SUB-SAHARAN AFRICA						
Central African Republic	58.6	24.2	38.1	30.0	7.3	2,837
Namibia	8.7	2.5	2.1	0.8	3.8	3,859
Uganda	46.2	33.4	23.6	12.7	6.5	6,027
Zimbabwe	51.6	28.8	30.8	17.5	4.9	2,364
ASIA/NEAR EAST/ NORTH AFRICA						
Egypt	23.3	19.9	3.8	2.1	0.6	11,454
India	11.9	6.2	1.8	-	-	50,001
Indonesia	23.7	18.6	7.4	4.4	2.1	16,983
Kazakhstan	16.9	9.6	6.0	2.0	3.5	810
Pakistan	18.3	18.3	-	-	-	4,061
LATIN AMERICA/ CARIBBEAN						
Bolivia	43.0	31.6	20.5	15.6	7.3	3,615
Brazil	16.7	10.3	5.4	3.7	2.7	4,782
Colombia	42.1	26.6	25.7	4.9	2.1	5,050
Dominican Republic	14.5	-	-	-	-	3,848
Guatemala	53.9	27.9	32.0	17.2	11.7	9,150

¹ More than 12 hours, except in Namibia (more than 24 hours), and India (unspecified).

² Core asked about fever with bad smelling vaginal discharge, but Namibia just asked about high fever.

Table 4.3 Birth complications by whether ANC and DC were received

Percent distribution of recent births with complications by whether the mother received antenatal (ANC) and delivery care (DC), only antenatal care, only delivery care, or neither type of care for that birth, Demographic and Health Surveys, 1990-1996

Country	ANC and DC	Only ANC	Only DC	Neither nor DC	Number of births with complications
SUB-SAHARAN AFRICA					
Central African Republic	45.6	23.5	2.5	28.3	1,662
Namibia	71.7	19.1	2.0	7.1	336
Uganda	40.2	51.6	0.7	7.4	2,785
Zimbabwe	70.1	24.8	0.8	4.3	1,220
ASIA/NEAR EAST/ NORTH AFRICA					
Egypt	33.2	12.8	24.6	29.1	2,669
India	51.1	14.4	9.6	25.5	5,950
Indonesia	46.6	35.4	1.8	16.1	4,025
Kazakhstan	97.0	0.0	2.9	0.0	137
Pakistan	18.2	13.2	6.0	62.0	1,188
LATIN AMERICA/ CARIBBEAN					
Bolivia	38.3	14.2	8.2	39.5	1,554
Brazil	82.8	4.3	9.1	3.6	799
Colombia	75.0	7.4	11.1	6.5	2,126
Dominican Republic	96.3	3.9	0.1	0.0	558
Guatemala	26.8	25.1	7.0	41.1	4,932

Table 4.4 Reported birth-related complications by residence, education, maternal age, and birth order/interval

Percentage of recent live births for which women reported symptoms of a birth-related complication, by residence, level of education, maternal age, and birth order/interval, Demographic and Health Surveys, 1990-1996

Country	Percent of births for which a complication was reported	Residence		Highest educational level			Maternal age at birth			Birth order/interval						
		Urban	Rural	None	Primary	Secondary	Secondary+	<20	20-34	35+	1	2-4, <24	2-4, 24+ 5+, <24	5+, 24+		
SUB-SAHARAN AFRICA																
Central African Republic	58.6	60.3	57.3	55.1	62.7	59.4	58.0	58.8	58.5	56.8	62.9	57.6	61.2	59.0		
Namibia	8.7	7.5	9.2	8.3	9.0	8.3	6.4	8.8	10.3	9.7	7.4	8.1	3.9	10.2		
Uganda	46.2	39.3	47.2	44.3	48.2	41.2	50.9	44.4	48.3	52.4	45.8	42.8	44.9	46.2		
Zimbabwe	51.6	44.2	54.1	48.6	52.1	51.8	55.4	52.5	41.1	57.0	50.8	52.0	36.9	46.9		
ASIAN/NEAR EAST/ NORTH AFRICA																
Egypt	23.3	21.7	24.2	21.2	28.5	22.8	25.9	22.4	25.9	29.5	18.0	20.8	20.2	24.7		
India	11.9	15.2	11.0	9.7	13.8	19.1	13.1	11.8	9.3	17.6	9.2	10.2	9.6	9.4		
Indonesia	23.7	24.0	23.6	21.9	22.8	26.4	23.0	24.5	19.6	27.3	22.6	22.4	22.0	21.6		
Kazakhstan	16.9	18.3	15.8	-	-	17.0	16.7	16.6	20.2	19.0	10.3	18.2	11.0	16.0		
Pakistan	18.3	19.6	17.6	18.0	13.9	22.7	19.4	18.1	17.5	19.1	17.2	17.1	19.4	18.8		
LATIN AMERICA/ CARIBBEAN																
Bolivia	43.0	41.1	45.1	41.4	44.2	42.1	46.4	42.4	43.2	47.8	40.2	39.7	45.4	43.8		
Brazil	16.7	16.7	16.5	21.5	17.8	15.2	16.0	16.5	19.2	16.4	16.3	16.6	14.6	19.6		
Colombia	42.1	39.9	46.2	47.1	44.9	39.2	48.6	40.9	39.6	47.7	35.5	38.9	39.0	45.6		
Dominican Republic	14.5	16.1	12.3	4.8	11.6	20.9	10.7	15.8	11.3	16.4	9.4	16.8	12.1	12.4		
Guatemala	53.9	49.2	56.2	58.0	52.7	46.0	58.4	52.0	57.5	60.1	50.6	49.4	54.6	55.7		

5 Perinatal Mortality and Maternal Health Care

Previous sections of this report described levels of service coverage for antenatal and delivery care. Such data are useful for monitoring changes in process indicators. Perinatal and maternal³ mortality, on the other hand, are often proposed as outcome indicators reflecting the impact of both service coverage and quality (Koblinsky et al., 1995). Perinatal mortality is measured as a rate for a given time period and is defined as the sum of all stillbirths and early neonatal deaths (deaths within the first week of life), divided by the sum of all stillbirths and live births and expressed per 1,000 events. Most of the deaths that make up this rate, stillbirths, and early neonatal deaths, are due to the same causes, many of which relate to low birth weight and complications that occur during labor and delivery.

In the calendar section of the DHS A Core Questionnaire, women are asked to report on each of their pregnancies and pregnancy outcomes for the five years preceding the survey. This data can be used to calculate a national perinatal mortality rate for countries where the A Core Questionnaire was used. In this section, these data are presented and discussed in conjunction with national level data on service coverage. It is important to note that the A Core Questionnaire is used in countries with higher levels of contraceptive use. These are countries that, therefore, are likely to have lower levels of perinatal mortality than those in which the B Core Questionnaire (without the calendar) is used. It is also worth explaining that the data collected in the calendar on pregnancy losses cannot be linked with data on service utilization at the individual level because the service utilization data were only collected for pregnancies that resulted in live births.

Table 5.1 presents the perinatal mortality rates for the four years preceding the interview. The stillbirth and early neonatal mortality rates, and the stillbirth/early neonatal death ratios are also presented as a crude index of data quality. While both stillbirths and early deaths are likely to be under reported, it is difficult to assess the extent to which such omissions occurred. The expected ratio for stillbirths to early neonatal deaths is approximately one to one, with a range from 0.5 to 1.5, depending on levels of care (Hoffman et al., 1984). Indonesia is the only country where the ratio is less than 0.5 and in 6 of the 13 countries with these data, the ratio is between 0.8 and 1.15.

The levels of perinatal mortality in these A Core countries range from a low of 21 in the Philippines to a high of 62 in

Bangladesh. With the exception of Morocco (43), all others are in the 20 to 40 range. Figure 5.1 shows national levels of perinatal mortality and percent of births with antenatal care for each country, arranged in order from lowest to highest levels of mortality. With the exceptions of Bolivia and Guatemala, a rough pattern is seen of increased mortality with decreased service coverage. Figure 5.2 shows the same graph for delivery care and gives a similar picture. In this case, Indonesia breaks with the pattern, as well as Bolivia and Guatemala, again. A more significant association between these indicators is unlikely to be seen for reasons previously discussed. For example, there are most certainly undocumented variations between countries in the quality of care and in access to care during a crisis, as well as perhaps differences in the relative distribution of causes of perinatal mortality. A stronger picture would likely emerge if data from a fuller range of mortality settings were available for inclusion in this analysis.

Table 5.1 Perinatal, stillbirth, and early neonatal mortality rates and ratios

Rates of perinatal mortality, stillbirths, and early neonatal mortality, and the stillbirth/early neonatal mortality ratio for the four-year period before the interview, Demographic and Health Surveys, 1990-1996

Country	DHS phase	Perinatal mortality rate	Stillbirth rate	Early neonatal mortality rate	Stillbirth/early neonatal death ratio
SUB-SAHARAN					
AFRICA					
Zimbabwe	III	32.5	16.6	15.9	1.04
ASIA/NEAR EAST/ NORTH AFRICA					
Bangladesh	III	62.0	28.5	33.4	0.85
Indonesia	III	34.7	10.9	23.8	0.46
Jordan	II	30.8	12.3	18.5	0.66
Morocco	III	42.7	20.8	21.9	0.95
Philippines	III	21.2	7.7	13.4	0.84
LATIN AMERICA/ CARIBBEAN					
Bolivia	III	36.5	12.4	24.1	0.51
Colombia	III	23.4	8.7	14.7	0.60
Dominican Rep.	II	33.1	16.7	16.4	1.17
Guatemala	III	32.2	11.7	20.6	0.57
Paraguay	II	29.1	15.6	13.5	1.15
Peru	II	27.3	9.2	18.1	0.51

³ See Stanton et al., 1997 for a full discussion of DHS data on maternal mortality.

Figure 5.1 Percentage of births for which mothers received antenatal care (ANC), and perinatal mortality rates (PMR), Demographic and Health Surveys, 1990-1995

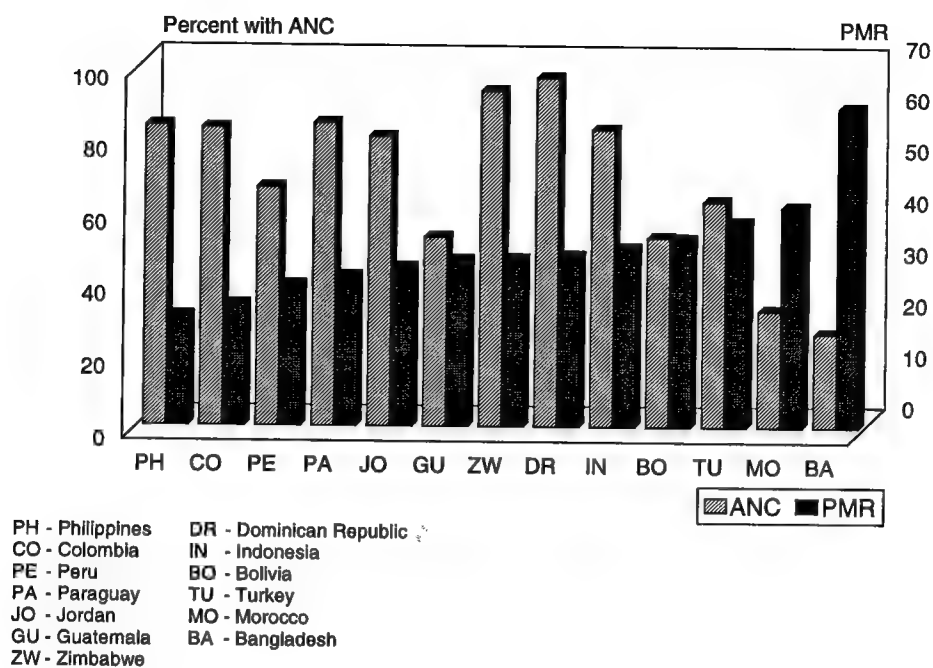
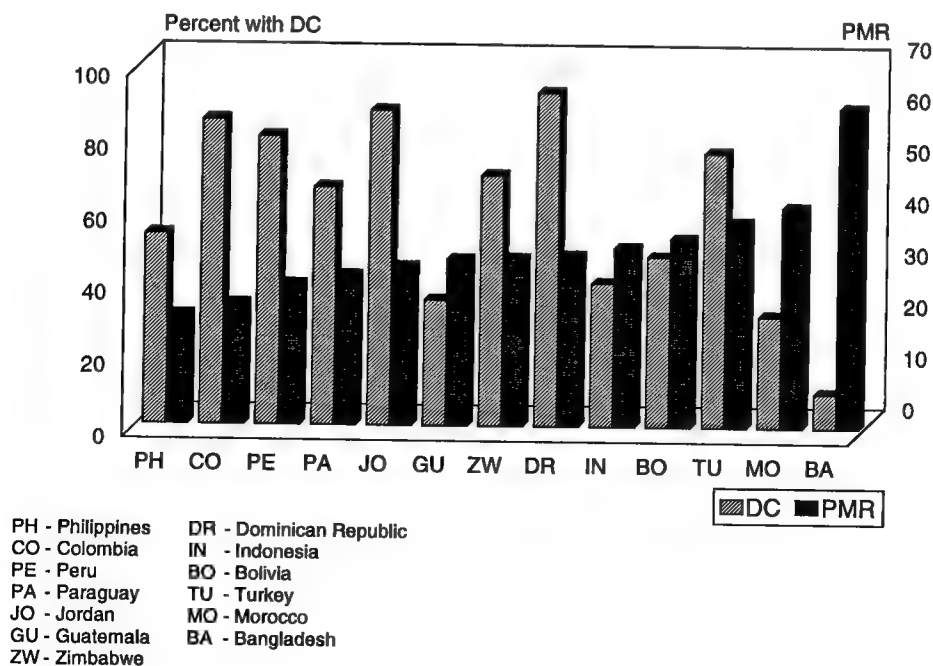


Figure 5.2 Percentage of births for which mothers received delivery care (DC), and perinatal mortality rates (PMR), Demographic and Health Surveys, 1990-1995



6 Summary

In summary, the data presented in this report give a crude indication of the health care situation that pregnant women have faced over the past five years in 35 developing countries. While coverage of antenatal care is above 90 percent in 9 of the 35 countries, 4 countries have levels below 35 percent. In a third of the countries surveyed, more than 25 percent of the births to women receiving antenatal care had missed opportunities for tetanus immunization during those visits. At the same time, in almost all countries, women receiving any tetanus immunizations are more likely to have had two doses than just one.

In general, women are less likely to be delivered by a trained attendant than to receive antenatal care or tetanus immunization. In addition, differentials in access to delivery care are much greater than for antenatal care and tetanus toxoid indicators. Births to urban women are two and a half to three times more likely to have delivery care than births to rural women in 15 countries. This is unfortunate, given the causative role of birth-related complications in maternal mortality. The problem of poor access to delivery care is further reflected by the finding that fewer than one-third of the countries have the recommended level of caesarean section deliveries between 5 and 15 percent.

Analysis of the change in indicators between subsequent surveys in the same country revealed approximated increases of more than 25 percent in seven countries for tetanus toxoid, in four countries for antenatal care, and in one country for delivery care. Examination of differentials for all three indicators shows that where coverage increased, access seems to have improved among women who are typically undeserved.

Data on perceived problems at childbirth indicate that women who think they have a problem are slightly more likely to deliver with a trained attendant. Examination of national levels of perinatal mortality and service coverage suggest that mortality levels are lower in countries with higher levels of service use.

While the data presented here are in no way comprehensive, they give some indication of where countries fall in relation to each other and point to populations within countries where problems of access and service availability are particularly relevant. It is hoped that these data will be supplemented in the future as further efforts are made to develop, test, and fine-tune new indicators and data collection instruments.

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Appendix

Summary of DHS-I, DHS-II, and DHS-III Surveys, 1985-1996

Region and Country	Date of Fieldwork	Implementing Organization	Respondents	Sample Size	Male/Husband Survey	Supplemental Studies, Modules, and Additional Questions
SUB-SAHARAN AFRICA						
DHS-I						
Botswana	Aug-Dec 1988	Central Statistics Office	AW 15-49	4,368		AIDS, PC, adolescent fertility
Burundi	Apr-Jul 1987	Département de la Population, Ministère de l'Intérieur	AW 15-49	3,970	542 Husbands	CA, SAI, adult mortality
Ghana	Feb-May 1988	Ghana Statistical Service	AW 15-49	4,488	943 Husbands	CA, SM, WE
Kenya	Dec-May 1988/89	National Council for Population and Development	AW 15-49	7,150	1,133 Husbands	
Liberia	Feb-Jul 1986	Bureau of Statistics, Ministry of Planning and Economic Affairs	AW 15-49	5,239		TBH, employment status
Mali	Mar-Aug 1987	Institut du Sahel, USED/CERPOD	AW 15-49	3,200	970 Men 20-55	CA, VC, childhood physical handicaps
Ondo State, Nigeria	Sep-Jan 1986/87	Ministry of Health, Ondo State	AW 15-49	4,213		CA, TBH
Senegal	Apr-Jul 1986	Direction de la Statistique, Ministère de l'Economie et des Finances	AW 15-49	4,415		CA, CD
Sudan	Nov-May 1989/90	Department of Statistics, Ministry of Economic and National Planning	EMW 15-49	5,860		FC, M, MM
Togo	Jun-Nov 1988	Unité de Recherche Démographique, Université du Bénin	AW 15-49	3,360		CA, SAI, marriage history
Uganda	Sep-Feb 1988/89	Ministry of Health	AW 15-49	4,730		CA, SAI
Zimbabwe	Sep-Jan 1988/89	Central Statistical Office	AW 15-49	4,201		AIDS, CA, PC, SAI, WE
DHS-II						
Burkina Faso	Dec-Mar 1992/93	Institut National de la Statistique et de la Démographie	AW 15-49	6,354	1,845 Men 18+	AIDS, CA, MA, SAI
Cameroon	Apr-Sep 1991	Direction Nationale du Deuxième Recensement Général de la Population et de l'Habitat	AW 15-49	3,871	814 Husbands	CA, CD, SAI
Madagascar	May-Nov 1992	Centre National de Recherches sur l'Environnement	AW 15-49	6,260		CA, MM, SAI
Malawi	Sep-Nov 1992	National Statistical Office	AW 15-49	4,850	1,151 Men 20-54	AIDS, CA, MA, MM, SAI
Namibia	Jul-Nov 1992	Ministry of Health and Social Services, Central Statistical Office	AW 15-49	5,421		CA, CD, MA, MM
Niger	Mar-Jun 1992	Direction de la Statistique et des Comptes Nationaux	AW 15-49	6,503	1,570 Husbands	CA, MA, MM, SAI
Nigeria	Apr-Oct 1990	Federal Office of Statistics	AW 15-49	8,781		CA, SAI
Rwanda	Jun-Oct 1992	Office National de la Population	AW 15-49	6,551	598 Husbands	CA

Senegal	Nov-Aug 1992/93	Direction de la Prévision et de la Statistique	AW 15-49	6,310	1,436 Men 20+	AIDS, CA, MA, MM, SAI
Tanzania	Oct-Mar 1991/92	Bureau of Statistics, Planning Commission	AW 15-49	9,238	2,114 Men 15-60	AIDS, CA, MA, SAI
Zambia	Jan-May 1992	University of Zambia	AW 15-49	7,060		AIDS, CA, MA
DHS-III						
Benin	Jun-Aug 1996	Institut National de la Statistique	AW 15-49	5,491	1,535 Men 20-64	AIDS, CA, MA, MM, SAI
Central African Republic	Sep-Mar 1994/95	Direction des Statistiques Démographiques et Sociales	AW 15-49	5,884	1,729 Men 15-59	AIDS, CA, CD, MA, MM, SAI
Comoros	Mar-May 1996	Centre National de Documentation et de la Recherche Scientifique	AW 15-49	3,050	795 Men 15-64	CA, MA
Côte d'Ivoire	Jun-Nov 1994	Institut National de la Statistique	AW 15-49	8,099	2,552 Men 12-49	CA, MA, SAI
Eritrea	Sep-Jan 1995/96	National Statistics Office	AW 15-49	5,054	1,114 Men 15-59	AIDS, CA, MA, MM, SAI
Ghana	Sep-Dec 1993	Ghana Statistical Service	AW 15-49	4,562	1,302 Men 15-59	CA, MA
Kenya	Feb-Aug 1993	National Council for Population and Development	AW 15-49	7,540	2,336 Men 15-54	AIDS, CA, MA, SAI
Malawi (KAP) ^a	Jun-Oct 1996	National Statistical Office	AW 15-49	2,683	2,658 Men 15-54	AIDS
Mali	Nov-Apr 1995/96	CPS/MSSPA et DNSI	AW 15-49	9,704	2,474 Men 15-59	AIDS, CA, MA, MM, SAI
Tanzania (KAP) ^a	Jul-Sep 1994	Bureau of Statistics, Planning Commission	AW 15-49	4,225	2,097 Men 15-59	AIDS, PC
Tanzania (In-depth)	Jun-Oct 1995	Bureau of Statistics, Planning Commission	AW 15-49	2,130		Adult and childhood mortality estimation
Tanzania	Jul-Nov 1996	Bureau of Statistics, Planning Commission	AW 15-49	8,120	2,256 Men 15-59	AIDS, CA, MA, MM
Uganda	Mar-Aug 1995	Statistics Department, Ministry of Finance and Economic Planning	AW 15-49	7,070	1,996 Men 15-59	AIDS, CA, MA, MM, SAI
Uganda (In-depth)	Oct-Jan 1995/96	Institute of Statistics and Applied Economics, Makerere University	AW 20-44	1,750	1,356 Partners	Negotiating reproductive outcomes
Zambia	Jul-Jan 1996/97	Central Statistics Office	AW 15-49	8,021	1,849 Men 15-59	AIDS, CA, MA, MM
Zimbabwe	Jul-Nov 1994	Central Statistical Office	AW 15-49	6,128	2,141 Men 15-54	AIDS, CA, MA, MM, PC, SAI

NEAR EAST/NORTH AFRICA

DHS-I

Egypt	Oct-Jan 1988/89	National Population Council	EMW 15-49	8,911		CA, CD, MM, PC, SAI, WE, WS
Morocco	May-Jul 1987	Ministère de la Santé Publique	EMW 15-49	5,982		CA, CD, S
Tunisia	Jun-Oct 1988	Office National de la Famille et de la Population	EMW 15-49	4,184		CA, S, SAI

DHS-II

Egypt	Nov-Dec 1992	National Population Council	EMW 15-49	9,864	2,466 Husbands	CA, MA, PC, SM
Jordan	Oct-Dec 1990	Department of Statistics, Ministry of Health	EMW 15-49	6,461		CA, SAI
Morocco	Jan-Apr 1992	Ministère de la Santé Publique	AW 15-49	9,256	1,336 Men 20-70	CA, MA, MM, SAI
Yemen	Nov-Jan 1991/92	Central Statistical Organization	EMW 15-49	5,687		CA, CD, SAI

DHS-III						
Egypt	Nov-Jan 1995/96	National Population Council	EMW 15-49	14,779		CA, FC, MA, WS
Morocco (Panel)	Apr-May 1995	Ministère de la Santé Publique	AW 15-49	4,753		
ASIA						
DHS-I						
Indonesia	Sep-Dec 1987	Central Bureau of Statistics, National Family Planning Coordinating Board	EMW 15-49	11,884		PC, SM
Nepal (In-depth)	Feb-Apr 1987	New Era	CMW 15-49	1,623		KAP-gap survey
Sri Lanka	Jan-Mar 1987	Department of Census and Statistics, Ministry of Plan Implementation	EMW 15-49	5,865		CA, NFP
Thailand	Mar-Jun 1987	Institute of Population Studies Chulalongkorn University	EMW 15-49	6,775		CA, S, SAI
DHS-II						
Indonesia	May-Jul 1991	Central Bureau of Statistics, NFPCB/MOH	EMW 15-49	22,909		PC, SM
Pakistan	Dec-May 1990/91	National Institute of Population Studies	EMW 15-49	6,611	1,354 Husbands	CA
DHS-III						
Bangladesh	Nov-Mar 1993/94	Mitra & Associates/NIPORT	EMW 10-49	9,640	3,284 Husbands	PC, SAI, SM
Bangladesh	Nov-Mar 1996/97	Mitra & Associates/NIPORT	EMW 10-49	9,127	3,346 EMM	CA, MA, SM
Indonesia	Jul-Nov 1994	Central Bureau of Statistics/ NFPCB/MOH	EMW 15-49	28,168		MM, PC, SAI, SM
Kazakstan	May-Aug 1995	Institute of Nutrition, National Academy of Sciences	AW 15-49	3,771		CA, MA
Nepal	Jan-Jun 1996	Ministry of Health/New ERA	EMW 15-49	8,429		CA, MA, MM
Philippines	Apr-Jun 1993	National Statistics Office	AW 15-49	15,029		MM, SAI
Turkey	Aug-Oct 1993	General Directorate of MCH/FP Ministry of Health	EMW <50	6,519		CA, MA
Uzbekistan	Jun-Oct 1996	Research Institute of Obstetrics and Gynecology	AW 15-49	4,415		CA, MA
LATIN AMERICA/CARIBBEAN						
DHS-I						
Bolivia	Feb-Jul 1989	Instituto Nacional de Estadística	AW 15-49	7,923		CA, CD, MM, PC, S, WE
Bolivia (In-depth)	Feb-Jul 1989	Instituto Nacional de Estadística	AW 15-49	7,923		Health
Brazil	May-Aug 1986	Sociedade Civil Bem-Estar Familiar no Brasil	AW 15-44	5,892		CA, S, SM, abortion, young adult use of contraception
Colombia	Oct-Dec 1986	Corporación Centro Regional de Población, Ministerio de Salud	AW 15-49	5,329		CA, PC, S, SAI, SM
Dominican Republic	Sep-Dec 1986	Consejo Nacional de Población y Familia	AW 15-49	7,649		CA, NFP, S, SAI, family planning communication
Dominican Republic (Experimental)	Sep-Dec 1986	Consejo Nacional de Población y Familia	AW 15-49	3,885		S, SAI
Ecuador	Jan-Mar 1987	Centro de Estudios de Población y Paternidad Responsable	AW 15-49	4,713		CD, SAI, employment

El Salvador	May-Jun 1985	Asociación Demográfica Salvadoreña	AW 15-49	5,207		CA, S, TBH
Guatemala	Oct-Dec 1987	Instituto de Nutrición de Centro América y Panamá	AW 15-44	5,160		CA, S, SAI
Mexico	Feb-May 1987	Dirección General de Planificación Familiar, Secretaría de Salud	AW 15-49	9,310		NFP, S, employment
Peru	Sep-Dec 1986	Instituto Nacional de Estadística	AW 15-49	4,999		NFP, employment, cost of family planning
Peru (Experimental)	Sep-Dec 1986	Instituto Nacional de Estadística	AW 15-49	2,534		
Trinidad and Tobago	May-Aug 1987	Family Planning Association of Trinidad and Tobago	AW 15-49	3,806		CA, NFP, breastfeeding
DHS-II						
Brazil (NE)	Sep-Dec 1991	Sociedade Civil Bem-Estar Familiar no Brasil	AW 15-49	6,222	1,266 Husbands	AIDS, PC
Colombia	May-Aug 1990	PROFAMILIA	AW 15-49	8,644		AIDS
Dominican Republic	Jul-Nov 1991	Instituto de Estudios de Población y Desarrollo (PROFAMILIA), Oficina Nacional de Planificación	AW 15-49	7,320		CA, MA, S, SAI
Paraguay	May-Aug 1990	Centro Paraguayo de Estudios de Población	AW 15-49	5,827		CA, SAI
Peru	Oct-Mar 1991/92	Instituto Nacional de Estadística e Informática	AW 15-49	15,882		CA, MA, MM, SAI
DHS-III						
Bolivia	Nov-May 1993/94	Instituto Nacional de Estadística	AW 15-49	8,603 ^b		AIDS, CA, CD, MA, MM, S, SAI
Brazil	Mar-Jun 1996	Sociedade Civil Bem-Estar Familiar no Brasil	AW 15-49	12,612	2,949 Men 15-59	AIDS, CA, MA, MM, PC, S
Colombia	Mar-Jun 1995	PROFAMILIA	AW 15-49	11,140		AIDS, CA, MA, PC
Dominican Republic	Aug-Dec 1996	CESDEM/PROFAMILIA	AW 15-49	8,422	2,279 Men 15-64	CA, MA
Guatemala	Jun-Dec 1995	Instituto Nacional de Estadística	AW 15-49	12,403		AIDS, CA, MA, MM, S
Haiti	Jul-Jan 1994/95	Institut Haitien de l'Enfance	AW 15-49	5,356	1,610 Men 15-59	AIDS, CA, CD, MA, SAI
Peru	Aug-Nov 1996	Instituto Nacional de Estadística e Informática	AW 15-49	28,951	2,487 Men 15-59	CA, MA, MM

^a No health or birth history section in questionnaire.

^b Household questionnaire was administered in 26,144 households.

AIDS acquired immune deficiency syndrome
 AW all women
 CA child anthropometry
 CD causes of death (verbal reports of symptoms)
 CMW currently married women
 EMW ever-married women

FC female circumcision
 M migration
 MA maternal anthropometry
 MM maternal mortality
 NFP natural family planning
 PC pill compliance

S sterilization
 SAI service availability information
 SM social marketing
 TBH truncated birth history
 VC value of children
 WE women's employment
 WS women's status

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